

UTAH OIL AND GAS CONSERVATION COMMISSION

REMARKS	WELL LOG	ELECTRIC LOGS	FILE	WATER SANDS	LOCATION INSPECTED	SUB. REPORT abd
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10-9-80 Approved for WTW

DATE FILED	3-8-85	LAND. FEE & PATENTED	STATE LEASE NO	PUBLIC LEASE NO	INDIAN 14-20-603-353
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DRILLING APPROVED	3-15-85 - OIL
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SPUDDED IN	7-11-85
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COMPLETED	8-22-85	PUT TO PRODUCING	8-22-85
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INITIAL PRODUCTION	57 BOPD, 23 MCF, 16 BOPD
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GRAVITY API	40.0
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GOR	400
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PRODUCING ZONES	5478' - 5491 Dent Creek zone I
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TOTAL DEPTH	5545'
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WELL ELEVATION	4686 KB
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DATE ABANDONED	
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FIELD	GREATER ANETH
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UNIT	RATHERFORD
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COUNTY	SAN JUAN
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WELL NO	RATHERFORD UNIT #18-12
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API #43-037-31153

LOCATION	1980' FNL	FT FROM (N) (S) LINE
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560' FWL

FT FROM (E) (W) LINE

SW NW

1 4 - 1 4 SEC

18

TWP	RGE	SEC	OPERATOR	TWP	RGE	SEC	OPERATOR
41S	24E	18	PHILLIPS OIL COMPANY				

040730

GEOLOGIC TOPS:

QUATERNARY	Star Point	Chinle	Molas
Alluvium	Wahweap	Shinarump 02110'	Manning Canyon
Lake beds	Masuk	Moenkopi	Mississippian
Pleistocene	Colorado	Sinbad	Humbug
Lake beds	Sego	PERMIAN	Brazer
TERTIARY	Buck Tongue	Kaibab	Pilot Shale
Pliocene	Castlegate	Coconino	Madison
Salt Lake	Mancos	Cutler	Leadville
Oligocene	Upper	Hoskinnini	Redwall
Norwood	Middle	DeChelly 02548'	DEVONIAN
Eocene	Lower	White Rim	Upper
Duchesne River	Emery	Organ Rock	Middle
Uinta	Blue Gate	Cedar Mesa	Lower
Bridger	Ferron	Halgaita Tongue	Ouray
Green River	Frontier	Phosphoria	Elbert
	Dakota	Park City	McCracken
	Burro Canyon	Rico (Goodridge)	Aneth
	Cedar Mountain	Supai	Simonson Dolomite
	Buckhorn	Wolfcamp	Sevy Dolomite
	JURASSIC	CARBON I FEROUS	North Point
Wasatch	Morrison	Pennsylvanian	SILURIAN
Stone Cabin	Salt Wash	Oquirrh	Laketown Dolomite
Colton	San Rafael Gr	Weber	ORDOVICIAN
Flagstaff	Summerville	Morgan	Eureka Quartzite
North Horn	Bluff Sandstone	Hermosa 44600'	Pogonip Limestone
Almy	Curtis		CAMBRIAN
Paleocene	Entrada	Pardox	Lynch
Current Creek	Moab Tongue	Ismay 5305'	Bowman
North Horn	Carmel	Desert Creek 5471'	Tapeats
CRETACEOUS	Glen Canyon Gr	Akah	Ophir
Montana	Navajo	Barker Creek	Tintic
Mesaverde	Kayenta		PRE - CAMBRIAN
Price River	Wingate	Cane Creek	
Blackhawk	TRIASSIC		

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK

DRILL ☒DEEPEN ☐PLUG BACK ☐

b. TYPE OF WELL

OIL
WELL ☒GAS
WELL ☐

OTHER

SINGLE
ZONE ☐MULTIPLE
ZONE ☐

2. NAME OF OPERATOR

Phillips Oil Company

3. ADDRESS OF OPERATOR

P.O. Box 2920, Casper, Wyoming 82602

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)

At surface

1980' FNL, 560' FWL (SW NW)

At proposed prod. zone

Same

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*

Approximately 3 miles southeast of Montezuma Creek, Utah

10. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drg. unit line, if any.)

560' East of

Ratherford Unit Lease

Line

16. NO. OF ACRES IN LEASE

2560 Acres

18. DISTANCE FROM PROPOSED* LOCATION TO NEAREST WELL, DRILLING, COMPLETED OR APPLIED FOR, ON THIS LEASE, FT.

1271' South of

#18-11

19. PROPOSED DEPTH

5700'

21. ELEVATIONS (Show whether DF, RT, GR, etc.)

4675' ungraded ground

23.

PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
17-1/2"	13-3/8"	48#	100'	150 sx (Circ to surface)
12-1/4"	9-5/8"	36#	1600'	600 sx (Circ to surface)
8-1/2"	7"	23# & 26#	5700'	600 sx (T.O.C. approx 2000')

Approval is requested to drill Ratherford Unit #18-12, a Desert Creek Development oil well. The subject well will be produced for a period of time, then it will be converted to a water injection well. The date of conversion from a production well to an injection well will be based on optimizing the ultimate recovery from the Ratherford Unit. A Sundry Notice will be submitted when the subject well is converted.

BOP equipment will be operated daily and tested weekly

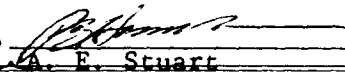
APPROVED BY THE STATE
OF UTAH DIVISION OF
OIL, GAS, AND MINING

DATE: 3/15/85
BY: John R. Bays
WELL SPACING: 1/3/2000'

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present well, zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24.

SIGNED


A. E. Stuart

TITLE

Area Manager

DATE January 25, 1985

(This space for Federal or State office use)

PERMIT NO.

APPROVAL DATE

APPROVED BY

TITLE

DATE

CONDITIONS OF APPROVAL, IF ANY:

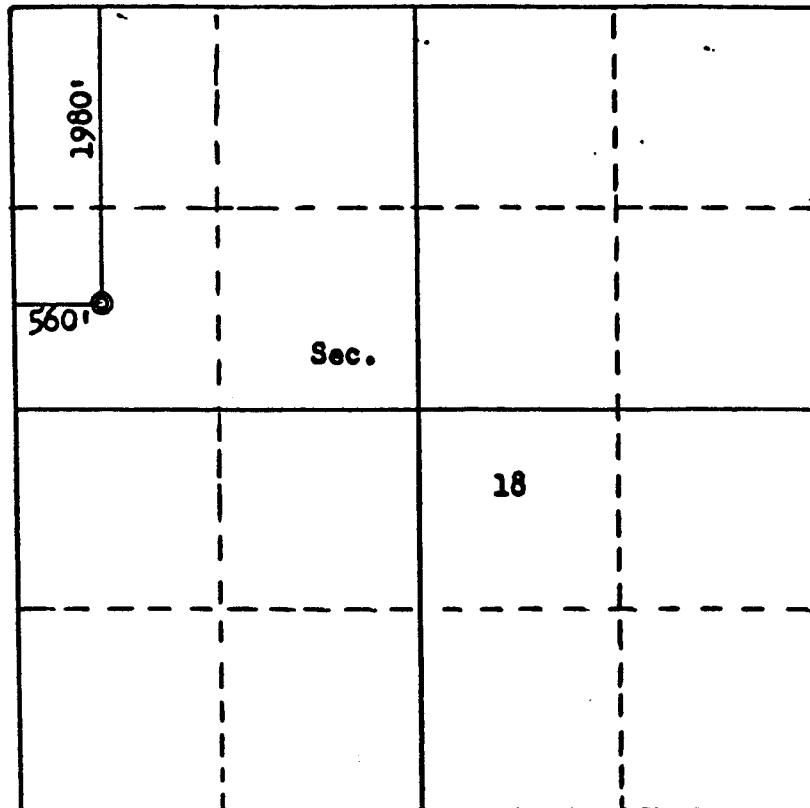
COMPANY PHI' PS OIL COMPANY

LEASE RATHEPFORD UNIT WELL NO. 18-12

SEC. 18, T. 41S, R. 24E
San Juan County, Utah

LOCATION 1980' FNL 560' FWL

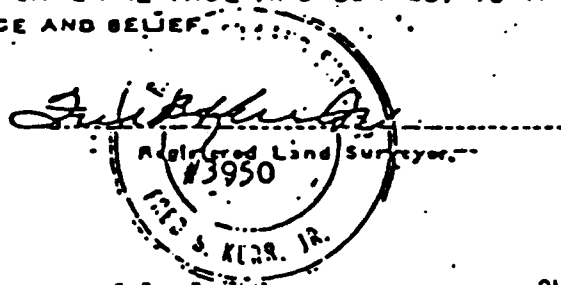
ELEVATION 4675 ungraded ground



SCALE—1 INCHES EQUALS 1 MILE

THIS IS TO CERTIFY THAT THE ABOVE PLAT WAS PREPARED FROM
FIELD NOTE OF ACTUAL SURVEYS MADE BY ME UNDER MY SUPER-
VISION AND THAT THE SAME ARE TRUE AND CORRECT TO THE
BEST OF MY KNOWLEDGE AND BELIEF.

SEAL:



SURVEYED July 1, 1984

FARMINGTON, N. M.

RATHERFORD UNIT #18-12

Supplement to Form 9-331C "Application for Permit to Drill, Deepen, or Plug Back."

DRILLING PROGRAM

1. Surface formation is the Dune Sand, which consists of loose windblown sand, age-recent.

Estimated tops of geologic markers:

Shinarump	2242'
DeChelly	2540'
Hermosa	4451'
Desert Creek Zone I	5449'

2. Brackish water-bearing sands are expected in the Navajo, Wingate, and DeChelly formations. Oil is expected to be encountered in the Ismay and Desert Creek formations. The top of cement will be approximately at 2000'.
3. Blow-out preventers will be 10" Series 900 equipment to be tested initially to 3000 psi. They will be inspected and operated daily and pressure tested weekly to 1500 psi. Weekly pressure tests will be supervised by representatives of Phillips Oil Company and the drilling contractor. Tests will be recorded on the daily drilling report which will remain on the rig floor during drilling operations. BOP tests will be conducted in accordance with Phillips standards, copy attached.

4. a. Proposed Casing Program:

1. Conductor casing:

100'	13-3/8"	48#/ft	H-40	ST&C	new
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2. Surface casing:

1600'	9-5/8"	36#/ft	K-55	ST&C	new
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Surface casing will be tested to 1500# before drilling out.

3. Production casing:

5700'	7"	23# & 26#/ft	K-55	ST&C	new
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Production casing will be tested to 3000#.

b. Proposed Cementing Program:

1. Conductor Casing:

Conductor casing will be cemented with 150 sks Class B cement. Cement will be brought to surface.

2. Surface Casing:

Surface casing will be cemented with 300 sks "light" cement followed with 300 sks Class B cement. Cement will be brought to surface.

3. Production casing:

Production casing will be cemented with "light" cement followed with Class B cement. For cement volume, caliper will be used with 15% excess. The top of the cement should be around 2000'. If other zones with hydrocarbon potential are encountered, they will be covered with cement.

c. Auxiliary Equipment:

Auxiliary equipment will include upper and lower kelly cocks, a drill string safety valve, and a pit level indicator.

5. Drilling Fluid:

Drilling fluid will be a fresh water based mud system. Spud mud is gel and water with a weight of 8.4-8.8 ppg. From the surface to approximately 1600', gel and water will be used. Mud weight may be up to 9 ppg to control water flow from the Wingate formation. A slurry of 8.6-9.5 ppg, 32-38 viscosity, and less than 15cc/30 min. water loss will be used from 1600'-5200'. Mud weight may be increased to 10.4 ppg if a water flow is encountered. From 5200' to total depth mud properties will be 10.5-12.5 ppg, 40-45 viscosity, and below 10 cc water loss.

Adequate quantities of mud materials will be stored at the location to equal the volume of the rigs complete circulating system. A flow sensor will be used.

6. Testing, logging, and coring:

The logging program will consist of DLL, GR, SP, and Caliper from T. D. to the surface casing. A FDC/CNL and a Micro-proximity log will be run from T. D. to 4300'. A temperature or cement bond log will be run to determine cement top. No coring or drill stem tests are planned.

7. Downhole Conditions:

Drilling in the area indicates no abnormal pressures, temperatures, or hydrogen sulfide gas.

8. Phillips anticipates starting operations in the first quarter of 1985. Drilling operations are estimated to take fifteen days per well.

CULTURAL RESOURCE REPORT

Abajo Archaeology has prepared a cultural resource inventory of the subject wellsite. A copy of the report has been sent to the BLM Farmington office. Pertinent information regarding the subject well is attached.

The cultural resource inventory was performed with the idea of the subject well being a water injection well. It is now proposed to initially produce the subject well for a period of time. A plat of the proposed leadline is attached. The proposed leadline route will follow water injection routes as outlined in the August 1984 Abajo Archaeology Report and tie into existing leadlines. When the subject well is converted to a water injection well, a Sundry Notice will be submitted.

SURFACE USE PROGRAM

1. Existing Roads

- a. Access to existing lease roads is approximately 3 miles southeast of Montezuma Creek, Utah.
- b. The existing roads will be maintained in the same or better condition.
- c. Refer to the attached access road map for road information.

2. Access Roads

Planned upgrading of existing access roads is shown on the attached map.

3. Location of Existing Wells.

Locations of existing wells are shown on the attached maps.

4. Production from the proposed well will be piped to Ratherford Unit Tank Battery #1, located in the SW SW Sec. 16-T41S-R24E San Juan County, Utah. The flowline will be visible from the existing lease roads. A plat of the proposed leadline is attached.

5. Water Supply

- a. The source of water to drill the subject well is from the River Booster, NE/4 Sec. 5., or from the Water Injection Plant, SE/4 Sec. 17 in T41S-R24E, San Juan County, Utah.
- b. The drilling water will be trucked from the water source to the subject well.
- c. A water supply well will not be drilled on the lease.

6. Construction Materials

- a. Only native soils will be used for construction of wellsite and the access road.
- b. Pit run rock will be used on the wellsite and access road when needed.
- c. The above materials are owned by the Navajo Tribe.

7. Waste Disposal

- a. Cuttings: Cuttings will be contained in a fenced reserve pit until dry enough to cover. Upon abandonment, the reserve pit area will be backfilled, shaped to natural topography, and seeded.
- b. Drilling Fluid: Drilling fluid will be contained in a fenced reserve pit until dry enough to cover. Upon abandonment, the reserve pit area will be backfilled, shaped to natural topography, and seeded.
- c. Garbage/Trash: All garbage and trash will be put in the burn pit. The burn pit will be fenced on four sides. After the burn pit is no longer in use, the trash and garbage will be covered with a minimum of 4 feet of fill.
- d. Salt: No salts are anticipated on this well. If salt is present, it will be disposed of in the reserve pit.
- e. Chemicals: Chemicals will be disposed of in the reserve pit.
- f. Sewage: Dry chemical toilets will be used.

8. Ancillary Facilities

No ancillary facilities are required.

9. Well Site Layout.

- a. Refer to attached Rig Layout plat
- b. There are no plans to line the reserve pit unless porous soil materials are encountered during construction.

10. Surface Reclamation Plans

- a. Construction Program: A cross section of the drill site showing cuts and fills is attached.
- b. Well Abandonment: All disturbed areas will be shaped to the natural topography and seeded in accordance with BLM requirements.

- c. Producing Well: Those areas not needed for production purposes will be recontoured to the surrounding topography. Seeding will be in accordance with BLM requirements.
 - d. Pipelines and flowlines: Flowlines will be above ground and follow or be visible from existing roads.
 - e. Rehabilitation will begin as soon as possible, considering weather and other factors, and proceed per recommendation of the BLM. The reserve pit will be reclaimed once it dries.
11. Surface Ownership: The wellsite location, access road and leadline are on the Navajo Indian Reservation. No dwellings are in the proposed drilling area.

12. Other information:

The reserve pit will be fenced on three sides during drilling and on the fourth side after the rig is moved out.

13. Operator's Representative and Certification.

a. Field Representative:

A. E. Stuart
P. O. Box 2920
Casper, Wyoming 82602
307-237-3791

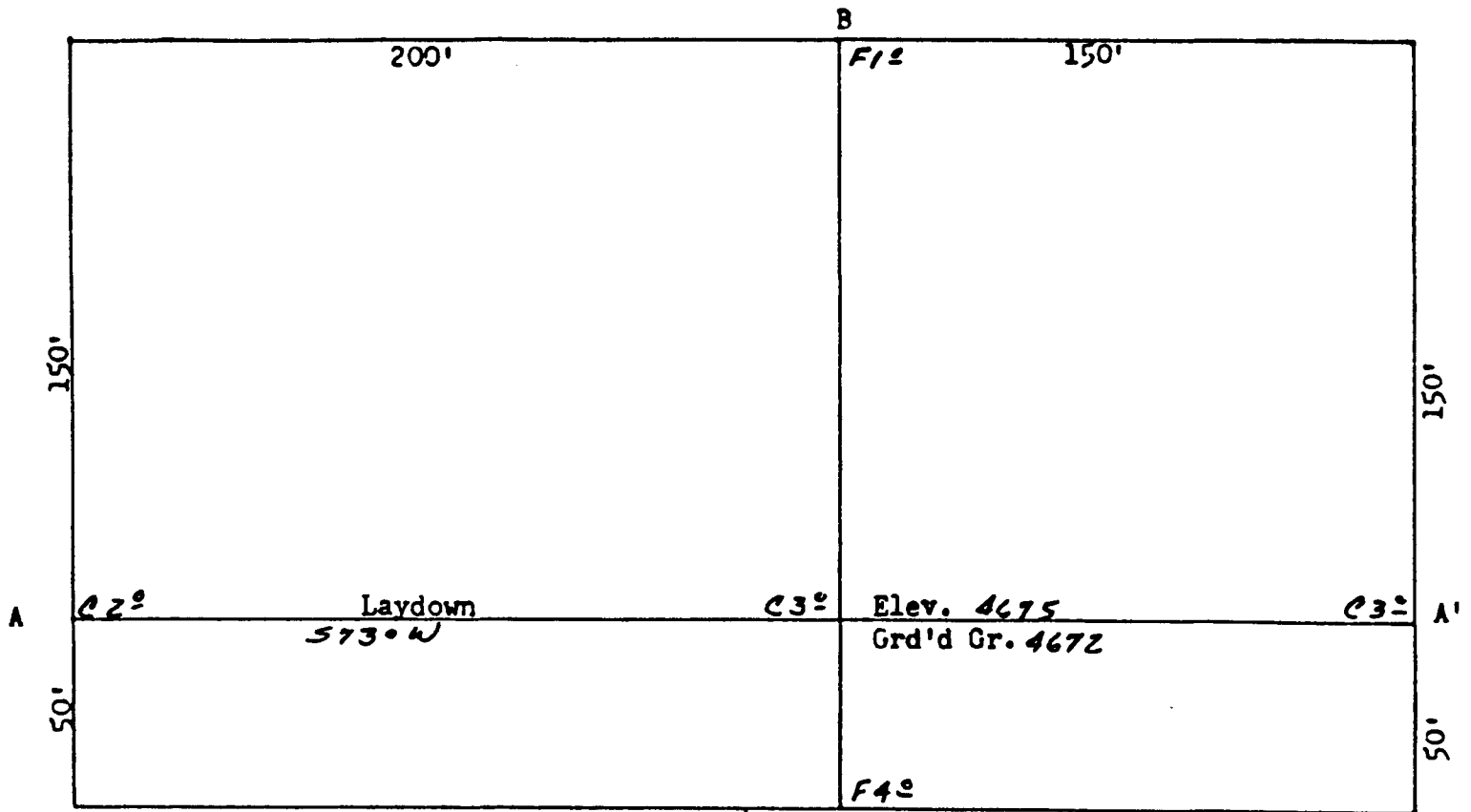
I hereby certify that I or persons under my direct supervision have inspected the proposed drill site and access route; and I am familiar with the conditions which currently exist; that the statements made in this plan are to the best of my knowledge true and correct; and that the work associated with operations proposed herein will be performed by Phillips Oil Company and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved. This statement is subject to the provisions of the 18 U.S.C. 1001 for the filing of a false statement.

Date 3-6-85

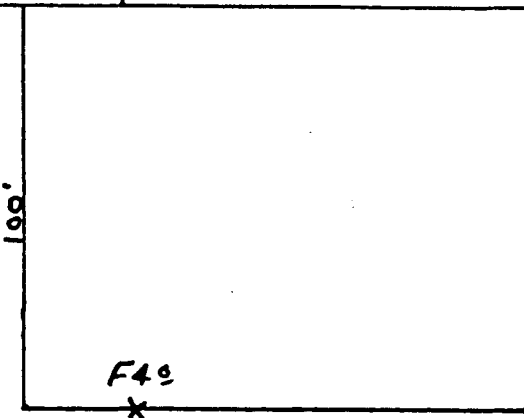

A. E. Stuart
Area Manager

BJM/fb (18)
Casper - RC

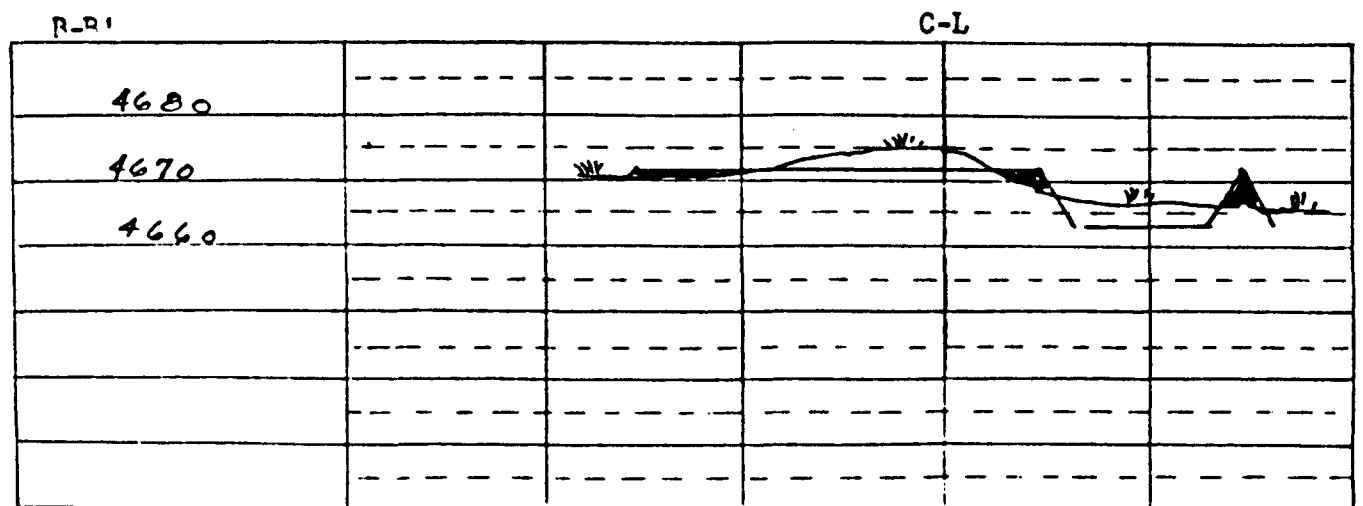
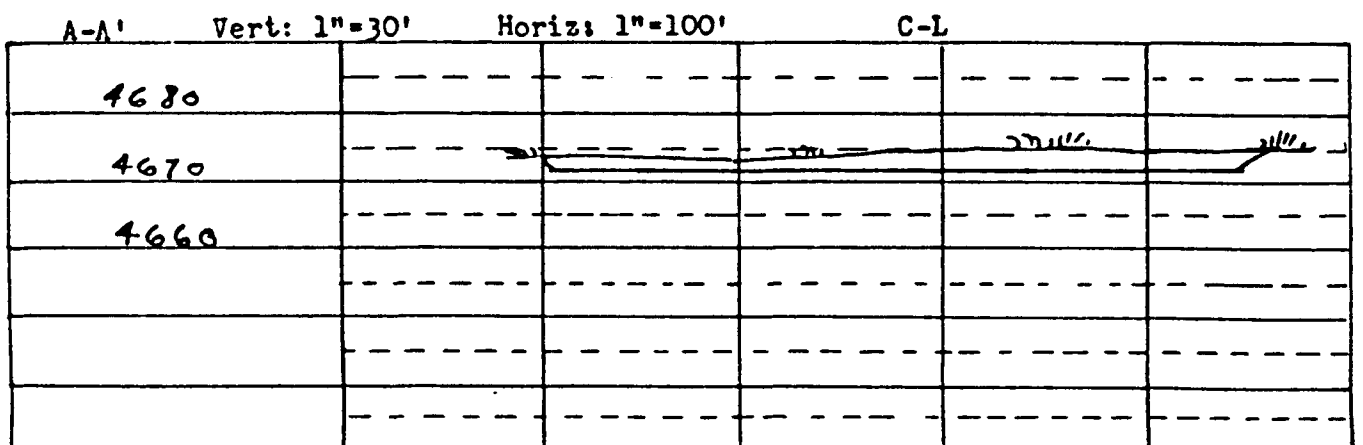
Profile for
 PHILLIPS OIL COMPANY #18- 12 RATHERFORD UNIT
 1980'FNL 560'FWL Sec. 18-T41S-R24E
 SAN JUAN COUNTY, UTAH

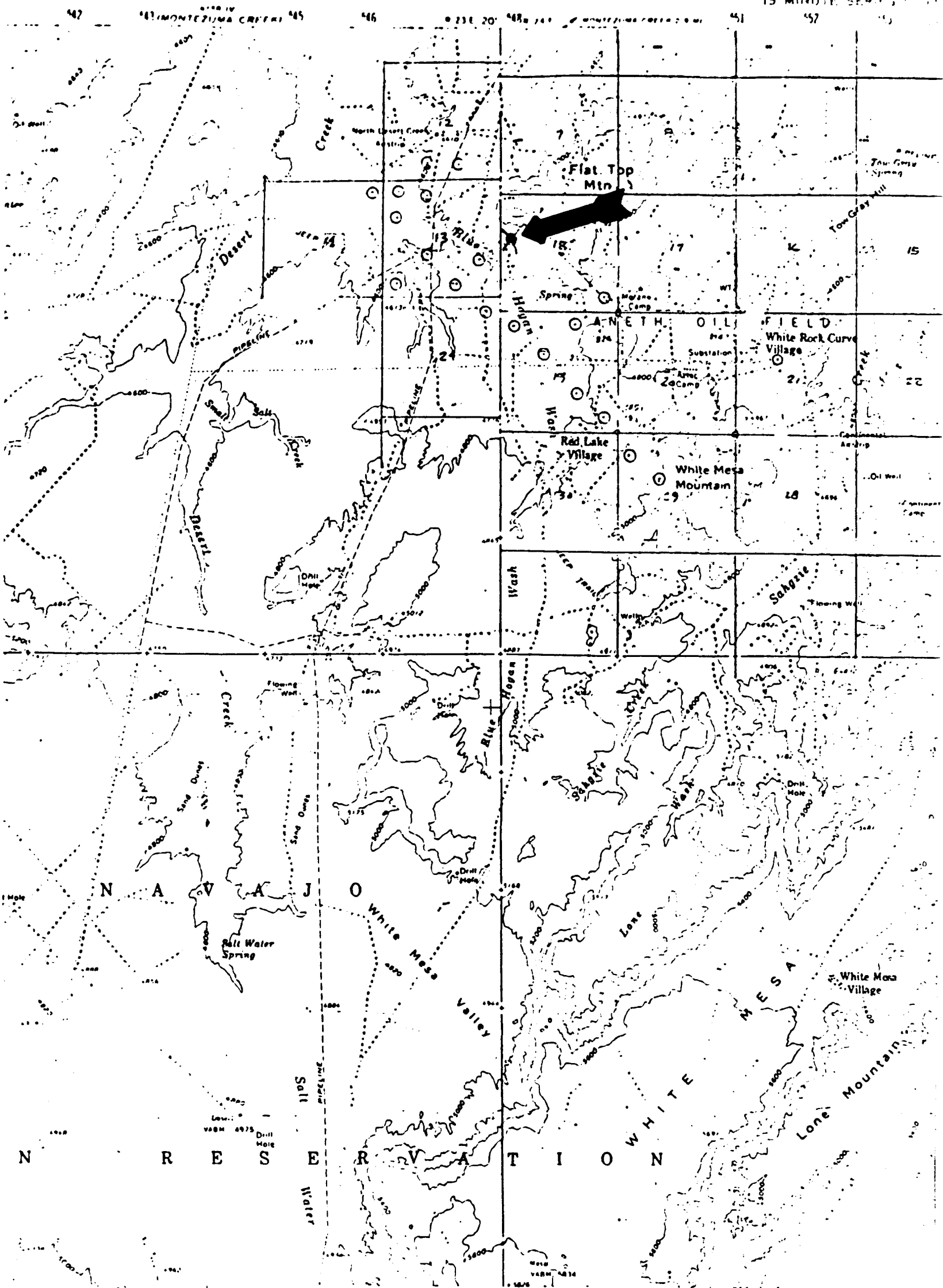


Scale: 1"=50'



B' 125'

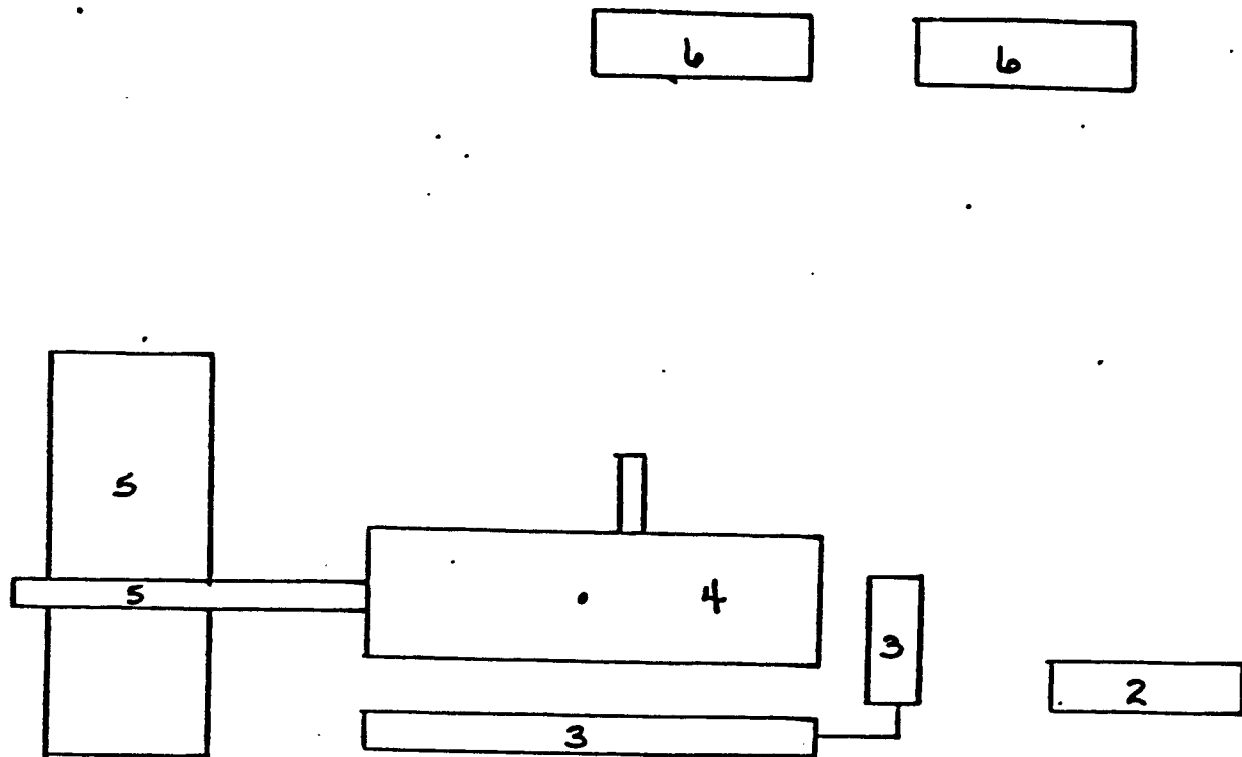




Vicinity Map for
 PHILLIPS OIL COMPANY #18- 12 RATHERFORD UNIT
 1980'FNL 560'FWL Sec. 18-T4LS-R24E
 SAN JUAN COUNTY, UTAH

AN

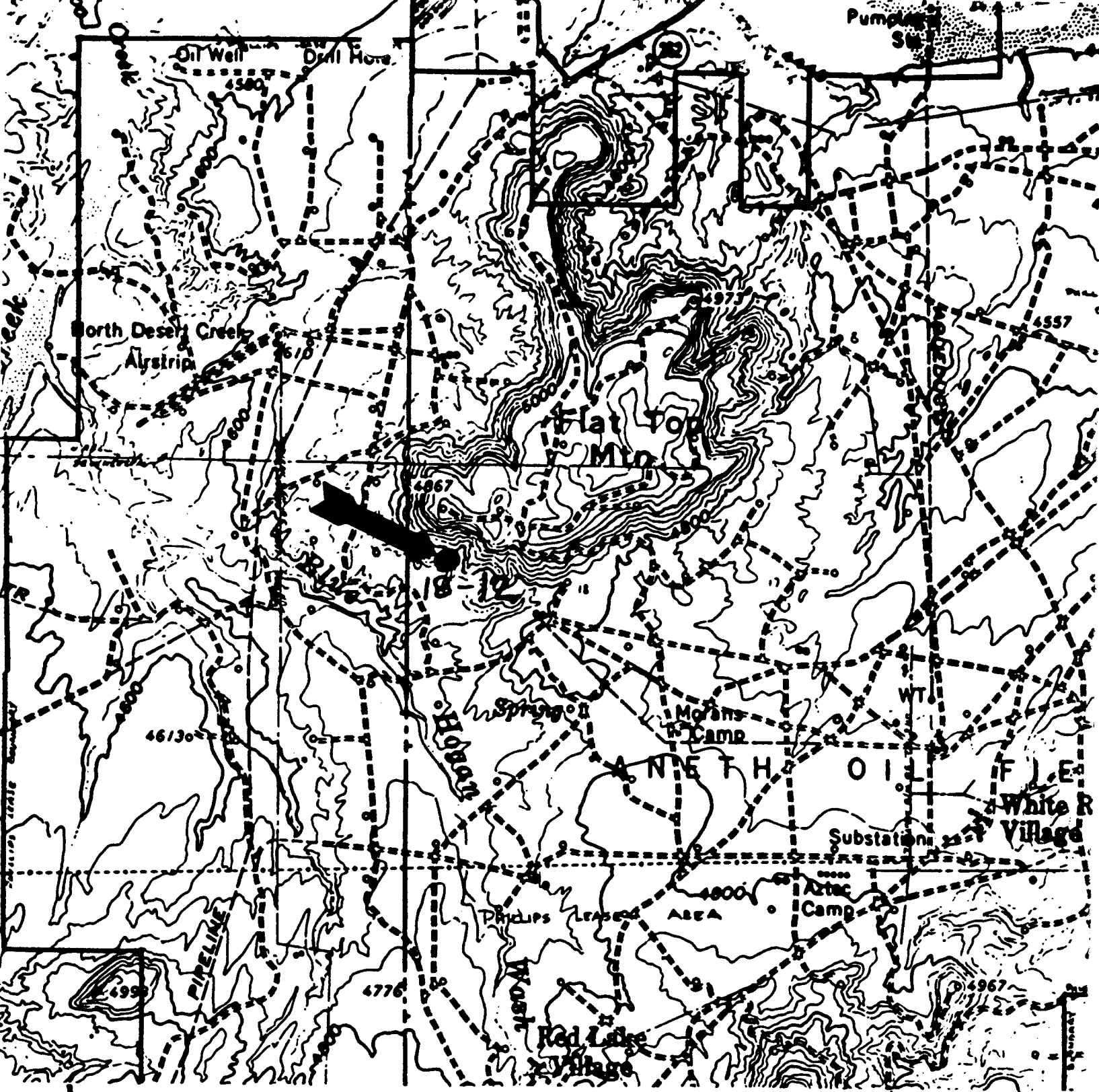
FATHERFORD UNIT
#18-12
SW NW Sec 18 T41S-R24E





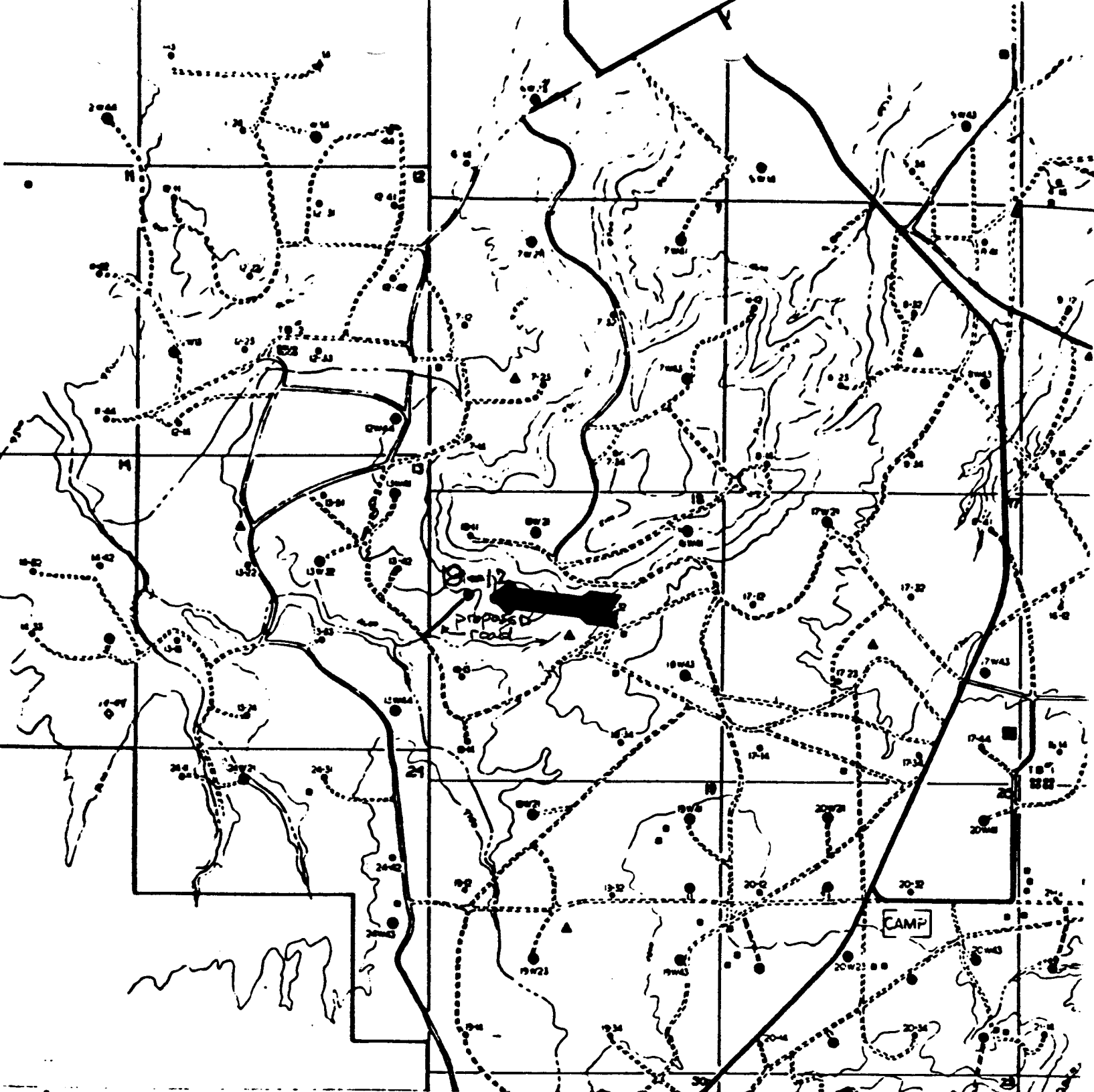
1. RESERVE PIT
2. TRASH PIT
3. CIR. PITS & PUMP
4. RIG
5. CAT WALK & PIPE RACKS
6. TRAILERS



DRILLING RIG LAYOUT

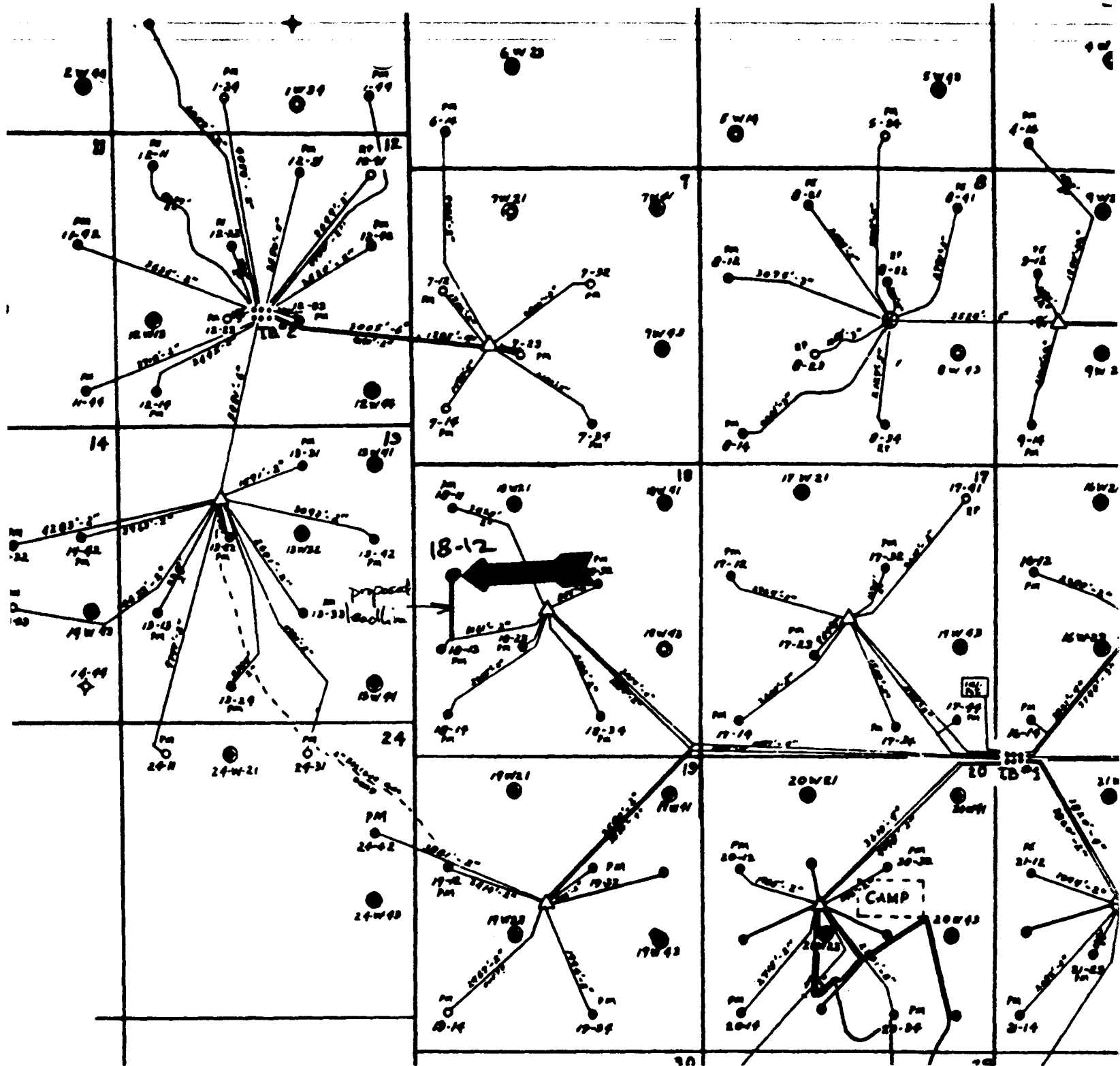
OUTLINE OF LOCATION - APPROXIMATELY 300' x 350'
NOT TO SCALE





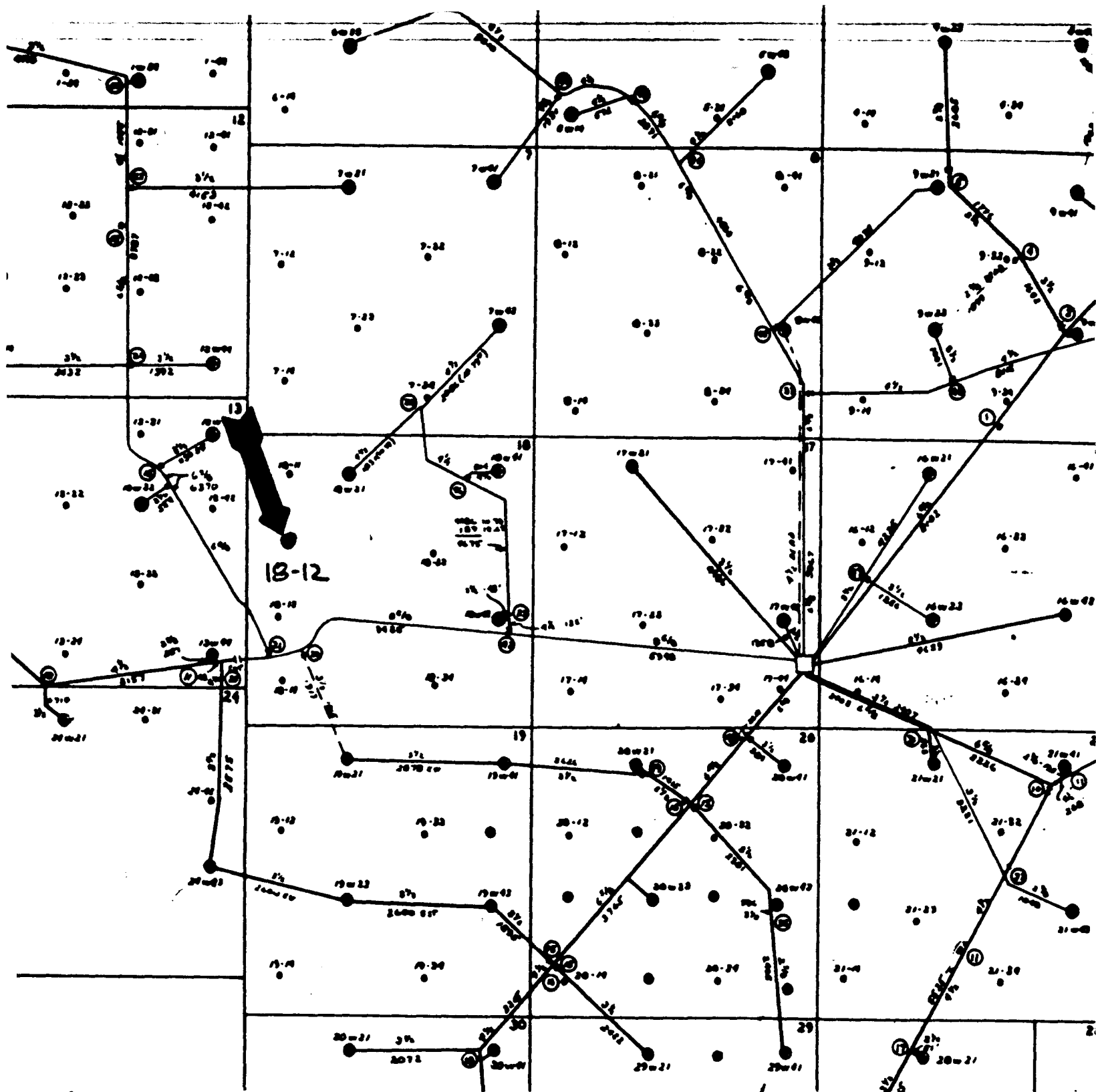
NO.	REVISION	BY	DATE	CHKD	APP'D
FOR BIDS	 PHILLIPS PETROLEUM COMPANY 			JA NO.	FILE COO
FOR APPR	BARTLESVILLE, OKLAHOMA			AFE NO.	SCALE
FOR CONST	RATHERFORD UNIT WELL 18-12 PROPOSED			DWG NO.	2 1/2" = 1'
DRAWN 3-30-94 BJM	SW NW SEC 18 T41S-R24E			SH	NO
CHECKED	SAN JUAN CO., UTAH				
APP'D					





NO.	REVISION		BY	DATE	CHKD	APP'D
FOR BIDS	 PHILLIPS PETROLEUM COMPANY BARTLESVILLE, OKLAHOMA				JA NO.	FILE CODE
FOR APPR					AFE NO.	SCALE 2.2"=1 mi
FOR CONST						
DRAWN 3-30-94 BJM		RATHERFORD UNIT WELL 18-12 PROPOSED ROAD PLAT SW NW SEC 18 T41S-R24E SAN JUAN CO., UTAH			DWG NO.	
CHECKED					SH NO.	
APP'D						



NO.	REVISION	BY	DATE	CHKD	APP'D
FOR BIDS	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>PHILLIPS PETROLEUM COMPANY BARTLESVILLE, OKLAHOMA</p> </div> <div style="text-align: center;">  </div> </div> <p>RATHERFORD UNIT WELL 18-12 PROPOSED LEADLINE PLAT SW NW SEC. 18 T41S-R24E SAN JUAN CO., UTAH</p>			JA NO.	FILE CODE
FOR APPR				AFE NO.	SCALE 2.2" = 1 mi
FOR CONST				DWG NO.	SH NO.
DRAWN 1-20-35 BJM					
CHECKED					
APP'D					



NO.	REVISION	BY	DATE	CHKD	APP'D
FOR BIDS	 PHILLIPS PETROLEUM COMPANY 			JA NO.	FILE CODE
FOR APPR	BARTLESVILLE, OKLAHOMA			AFE NO.	SCALE
FOR CONST	RATHERFORD UNIT WELL 18-12 WATER INJECTION LINES SW NW SEC. 18 T41S-R24E SAN JUAN CO., UTAH			2.2" = 1 mi	
DRAWN 1-20-95 BJM				DWG NO.	
CHECKED				SH NO.	
APP'D					

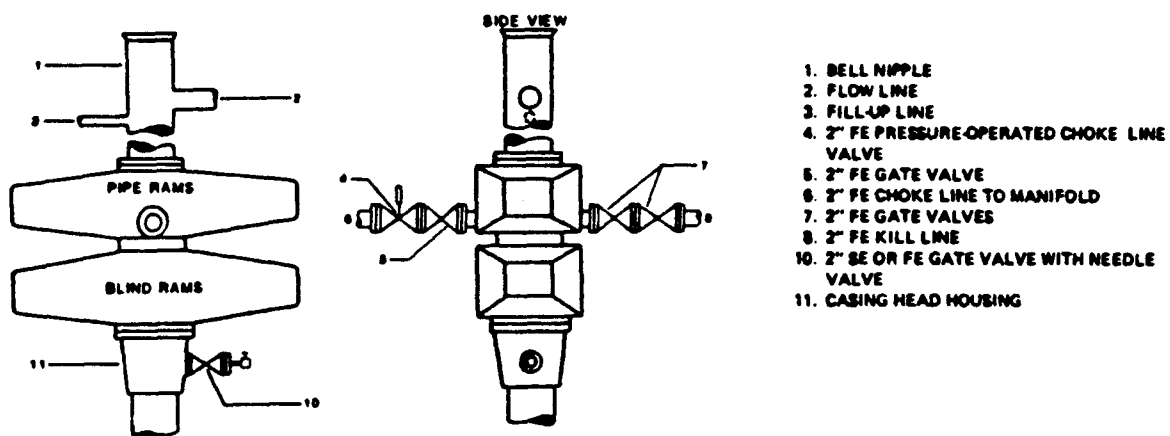


Figure 7-10. Standard Hydraulic Blowout Preventer Assembly
(2 M or 3 M Working Pressure) Alternative 3 (without Drilling Spool)

Well Control 4
January/83

PHILLIPS PETROLEUM COMPANY



Page 251
Section II

7.6 Testing Surface Blowout Preventer Equipment

7.6.1 Pressure Test Frequency

All rams, annulars, valves, choke and kill lines, choke manifold, kelly cocks, and safety valves shall be pressure tested at the following frequencies:

- (1) Initial installation of blowout preventers.
- (2) After setting casing, before drilling cement.
- (3) Every 7 days or on first trip out of hole after 7 days since previous pressure test.
- (4) After any component of the blowout preventer assembly is disturbed, replaced or repaired (this includes lines, valves, or choke manifold). In this case, the component changed may be the only component tested.
- (5) Prior to conducting first drill stem test in a series of one or more DST's.
- (6) Any time the Phillips Wellsite Supervisor deems necessary, such as prior to drilling into suspected high pressure zones.



7.6.2 Function Test Frequency

All rams, annulars, valves, and other items specified below, shall be function tested at the following frequencies.

- (1) On initial installation from driller control and remote panel.
- (2) Each trip out of hole alternating between driller's and remote control panel but not more than once every twenty-four (24) hours. Close pipe rams or annular preventer ONLY on drill pipe.

7.6.3 Test Pressures

Use the following table to identify which test is appropriate and at what pressure.

TEST	DESCRIPTION
Low Pressure	Test to 200-300 psi prior to each high pressure test.
Initial Installation	<p>Test all rams, annulars, valves, choke manifold, kelly cocks, and safety valves to the lesser of the following pressures.</p> <ul style="list-style-type: none"> . Rated working pressure of the component in the blowout preventer assembly with the exception of annular preventer which is to be tested to 70% of the rated working pressure. . The API rated casing burst pressure of the last casing to be utilized in the well with the BOP assembly being tested. . Rated working pressure of the casing head. . If "Cup Tester" is used do not exceed 80% of the API rated burst pressure of the casing.
Repair	Repaired or replaced components are to be tested to the same pressures used in the Initial Test.



FIELD PRACTICES AND STANDARDS

7.6.3, cont'd

TEST	DESCRIPTION
Weekly and After Setting Casing	<p>Test all rams, annulars, valves, choke and kill lines, choke manifold, kelly cocks, and safety valves, to the lesser of the following pressures.</p> <ul style="list-style-type: none">. 50% of the rated working pressure of the component to be tested.. 80% of the API rating of the casing burst pressure then in the well.. Test blind rams during internal casing pressure test. (Refer to drilling program for test pressures).
DST Operations	<p>Test all pipe rams, annular preventers, valves, choke and kill lines, choke manifold, kelly cocks, and safety valves to the maximum anticipated surface pressure expected while conducting drill stem tests. Do not test annular to more than 70% of its working pressure.</p>
Shallow Casing	<p>Where cased hole is less than 2000 feet measured depth, the test pressure may be 1.5 psi per foot of casing depth, not to exceed 80% of the API rated burst pressure. In the case of shallow conductor casing or drive pipe (500 feet or less) that is equipped with one BOP, then the test pressures do not need to exceed 1.0 psi per foot of casing depth.</p>
Accumulator	<p>Test accumulator to the manufacturer's rated working pressure. Test the accumulator for time to pump up to specifications.</p>

7.6.4 Blowout Preventer Test Practices

- (1) All pressure tests shall be witnessed by Phillips' Representative and the Contractor's Senior Supervisor on Location. All tests shall be recorded on the Phillips' Daily Drilling Report, the IADC Report and the BOP Test Form; see Figure 7-13. A reproducible copy of the BOP Test Form (Figure 7-13) can be found in Section III.



7.6.4, cont'd

- (2) Hold all low pressure tests for three minutes and high pressure tests for five minutes or until Phillips Representative and the Contractor's Senior Supervisor are satisfied no leaks exist.
- (3) A detail procedure for the testing of blowout preventer and choke manifold equipment will be included in the drilling programs. The procedure is to be distributed for each drilling unit under contract by the operating office. Each operating office must include the following practices:
 - a. Prior to testing, all lines and valves will be thoroughly flushed to ensure the system is clear. Test all opening and closing control lines to 1500 psi and inspect for leaks.
 - b. If necessary, run a stand of drill collars below the test plug to prevent unseating the test tool during testing.
 - c. All precautions must be taken to avoid pressuring the casing below the test tool.
 - d. The running string is to be full of water (or antifreeze solution) for immediate indication of test tool leakage.
 - e. All pipe rams, blind/shear rams, blind rams, annular preventers, valves, fail-safe valves, choke and kill lines are to be tested at the frequencies and pressures outlined in this section.
 - f. Drill pipe safety valve, lower and upper kelly cocks are to be tested from below at pressures and frequencies outlined in this section.
 - g. All test fluids are to be bled back to the pump unit in safe manner.

7.6.5 Testing Wellhead Pack-offs

The wellhead pack-off is to be pressure tested upon installation for five minutes. Test pressure is to be 80% API rated casing collapse or the rated working pressure of the casing head whichever is the lesser. Casing annulus valve(s) must be in open position to prevent casing collapse during pack-off testing.

When testing the wellhead pack-off, use recorded test pressures and volumes to determine if pack-off is leaking. Pressure should be immediately released at the first indication of a leak.



7.6.6 Safety Precautions

One pumping unit operator is to be stationed at the high pressure pumping unit, and is to remain at this station until all testing has been completed. The pump unit operator is to be in continuous communication with the person who is recording the test data. The Phillips Wellsite Supervisor and Contractor's Senior Supervisor on location will be the only personnel who will go into the test area to inspect for leaks when the equipment involved is under pressure. The rig crews are to stay clear of the area until such time that both the Phillips Wellsite Supervisor and the Contractor's Senior Supervisor have contacted the pumping unit operator and all three have agreed that all pressure has been released, and there is no possibility of pressure being trapped. The rig crews may then go into the area to repair leaks or work as directed.

All lines, swings, and connections that are used in the testing of the blowout preventers are to be adequately secured in place.

Pressure is to be released only through the pressure release lines that are vented back into the pump unit tanks. The lines are to be clamped down to direct the flow into unit tanks.



ARCHAEOLOGICAL SURVEYS OF 13 PROPOSED WELL LOCATIONS,
THEIR ASSOCIATED ACCESS ROADS AND FLOW LINE ROUTES,
AND 9 MILES OF PROPOSED WATER INJECTION LINE ROUTES
IN SAN JUAN COUNTY, SOUTHEASTERN UTAH

12-W24	13-12	13-43
12-34	13-14	18-W12
14-41	13-21	24-41
13-11	13-23	29-22
	13-34	

Water Injection Lines: Mainline and Lines A, B, C,
D, E, F, F-1, G, H, I, and J

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Navajo Nation Antiquities Permit No. 1984-24
United States Department of the Interior
Bureau of Indian Affairs
Branch of Environmental Quality Control Authorization
BIA-NAO-84-ABA-048-1
and
Utah State Permit No. U-84-8-5-i

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ABSTRACT

Cultural resource surveys were conducted as part of the Rutherford Unit expansion project for Phillips Oil Company, in southeastern San Juan County, Utah. The surveys were performed on August 4, 6, 7, 9, and 11, 1984 on 13 proposed well location sites, eight associated access roads, portions of six associated flow line routes, and along nine miles of proposed injection line. The project area occurs in Sections 11, 12, 13, 14, and 24 in T 41 S, R 23 E and Sections 7, 17, and 18 in T 41 S, R 24 E, USGS White Mesa Village Quadrangle, Utah, 15'. It is under jurisdiction of the Bureau of Indian Affairs.

Seventeen isolated finds and one Anasazi Basketmaker II to Pueblo I artifact scatter (SJC-1106) were located during the survey. The isolated finds are not considered significant in terms of the eligibility criteria set forth in the National Register of Historic Places, thus, archaeological clearance is recommended for the project area, except the 100 meters of mainline injection pipeline east of its juncture with line J. It is recommended that the pipeline be rerouted or that an archaeologist be present to monitor construction of that portion of pipeline.

INTRODUCTION

On August 4, 6, 7, 9, and 11, 1984, cultural resource surveys were conducted within the Rutherford Unit south of Montezuma Creek, southeast San Juan County, Utah (Figure 1). The surveys were requested by Mr. Max Issacs, supervisor of Phillips Oil Company of Cortez, Colorado, and carried out at the request of Mr. Bob Hogg, engineer, and Mr. John White, who replaced Mr. Max Issacs. Both Mr. Hogg and Mr. White were present in the field during portions of the survey. Mr. Hogg assisted the archaeologist by flagging the access routes and flow lines during the survey. The project consisted of 13 proposed well locations, their associated access routes and flow lines, and approximately nine miles of proposed injection pipeline.

The project area lies within the boundaries of the Navajo Reservation (Tables 1 and 2) which is under the jurisdiction of the United States Department of the Interior, Bureau of Indian Affairs and the Navajo Nation. Cultural resources are administered by the USDI-BIA, Branch of Environmental Quality and by the Navajo Nation Cultural Resource Management Program.

The purpose of the survey was to verify the presence of and document any cultural resources within the proposed project impact areas. The accomplishment of these objectives fulfills compliance requirements for the preservation of archaeological and historical resources set forth by the American Antiquities Act of 1906, the Historic Preservation Act of 1966, the National Environmental Policy Act of 1969, Executive Order No. 11593 of 1971, the Archaeological and Historical Conservation Act of 1974, and the Archaeological Resources Protection Act of 1979. Cultural resources occurring on Navajo Tribal lands are further protected by Tribal laws: CJA-16-72 of 1972, Res. ACAP-86-77 of 1977, and the Navajo Tribal Code, Title Nineteen, Sections 1002 and 1004.

Field work was conducted under the Navajo Nation Antiquities Permit No 1984-24, the USDI-BIA, Environmental Quality Authorizaion No. BIA-NAO-84-048-1, and State of Utah Permit No. U-84-8-5-i. These permits and authorizations were granted to Abajo Archaeology of Bluff, Utah. BIA-NAO-84-ABA-048-1 is a "non-collection, non-disturbance" use authorization to conduct archaeological surveys on Navajo Tribal lands. The surveys were performed by Debra Foldi, an archaeological consultant with Abajo Archaeology. Dr. Anthony Klesert, Director of the Navajo Nation Cultural Resource Management Program and Mr. Terry

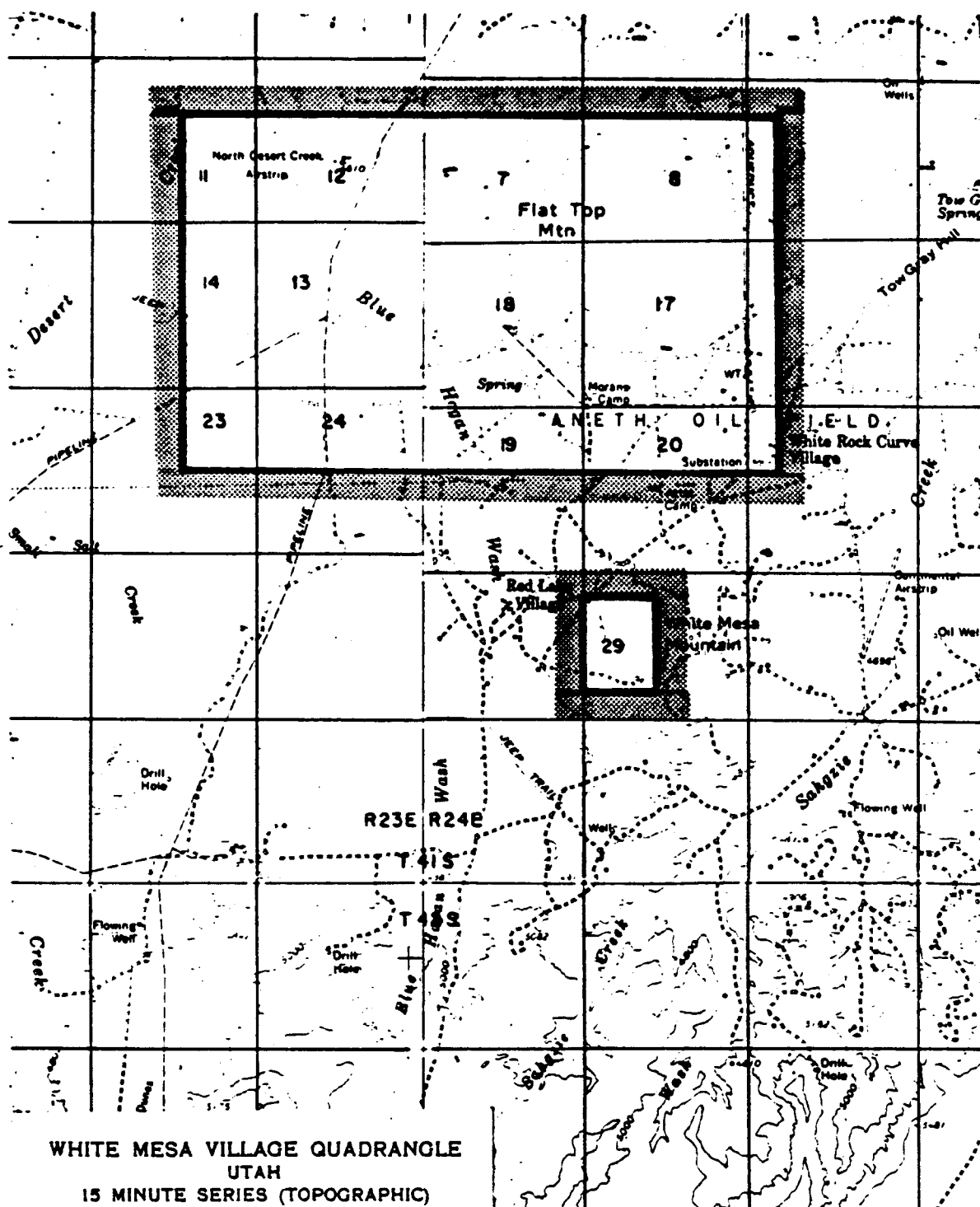


Figure 1. Location of Phillips Oil Company Rutherford Unit - 1984 expansion project. Stippling outlines project area.

Map Scale: 1:62,5000

TABLE 1

Legal Description of Project Area

Jurisdiction: Navajo Nation

Map: White Mesa Village Quadrangle, Utah, 1962, 15'

Well Pad	Legal Location	UTM (Zone 12)	Access Route, Length
12-W24	CTSESW, Sec.12 T 41 S, R 23 E	647,000 m E 4,121,825 m N	300 feet (runs west from location)
12-34	SESWSE, Sec.12 T 41 S, R 23 E	647,700 m E 4,121,800 m N	600 feet (runs SSW from location)
14-41	NENENE, Sec.14 T 41 S, R 23 E	646,250 m E 4,121,950 m N	1000 feet (runs west from location)-flow line follows access
13-11	CTNWNW, Sec.13 T 41 S, R 23 E	646,600 m E 4,121,950 m N	800 feet (runs north from location)-flow line follows access
13-12	NWSWNW, Sec.13 T 41 S, R 23 E	646,600 m E 4,121,075 m N	1300 feet (runs west from location)-flow line follows access
13-14	CTSWSW, Sec.13 T 41 S, R 23 E	646,600 m E 4,120,175 m N	800 feet (runs WSW from location)
13-21	CTNENW, Sec.13 T 41 S, R 23 E	647,000 m E 4,121,400 m N	No access surveyed No flow line surveyed
13-23	CTNWSW, Sec.13 T 41 S, R 23 E	647,000 m E 4,120,600 m N	No access surveyed No flow line surveyed
13-34	CTSWSE, Sec.13 T 41 S, R 23 E	647,700 m E 4,120,200 m N	600 feet (runs south from location)-flow line follows access
13-43	SWNESE, Sec.13 T 41 S, R 23 E	647,750 m E 4,120,500 m N	600 feet (runs NNE from location)-flow line follows access
18-W12	CTSWNW, Sec.18 T 41 S, R 24 E	648,225 m E 4,120,300 m N	500 feet (runs ENE from location)-flow line follows access
24-41	CTNENE, Sec.24 T 41 S, R 23 E	647,825 m E 4,119,800 m N	No access surveyed No flow line surveyed
29-22	SWSENW, Sec.29 T 41 S, R 24 E	650,080 m E 4,117,600 m N	900 feet (runs east from location)-flow line follows access

TABLE 2

Legal Descriptions of Water Injection Lines

Jurisdiction: Navajo Nation

Map: USGS White Mesa Village Quadrangle, Utah, 1962, 15'

Line	Legal Location	Length (Ft.)
Main	SE & SW of SE, SE & SW of SW, Sec.17, T41S, R24E SE & SW of SE, SE & SW of SW, Sec.18, T41S, R24E SE & NW of SE, SE & NW of NW, Sec.13, T41S, R23E SE of SE, Sec.11, T41S, R23E	18,500
A	SE & NE of SE, Sec.17, T41S, R24E	1,250
B	Eastern portion of: SE & NE of SE and SE & NE of NE and NENW of NE, Sec.18, T41S, R24E	6,900
C	SE & NE of SW, Sec.18, T41S, R24E	1,400
D	SW & NW of SW, SW of NW, Sec.18, T41S, R24E SE of NE, Sec.13, T41S, R23E	3,250
E	SE of NW, NW & NE of NE, Sec.13, T41S, R23E SE of SE, Sec.12, T41S, R23E SW of SW, Sec. 7, T41S, R24E	5,500
F	NW of NW, Sec.13, T41S, R23E SE of SW and NW of SE, Sec.12, T41S, R23E	3,850
F-1	SE of SW and SW of SW and NW of SW, Sec.12, T41S, R23E	1,500
G	NW of NW, Sec.13, T41S, R23E/SE of NE, Sec.14, T41S, R23E	1,700
H	SE of NW and NW of SW, Sec.13, T41S, R23E	1,500
I	NE of SE and SE of SW, Sec.13, T41S, R23E	1,700
J	SW of SW, Sec.18, T41S, R24E	300

Del Bene of the USDI-BIA Branch of Environmental Quality
were notified prior to performance of the field surveys.

DESCRIPTION OF THE PROJECT AREA

The Phillips Oil Company, ^ARutherford Unit development project is located in the extreme southeastern portion of San Juan County, just south of Montezuma Creek, Utah. The San Juan River flows to the north (2.5 miles), White Mesa Mountain is to the south, and Flat Top Mountain is situated within the project area. The ^ARutherford Unit project is within the Blanding Basin of the Colorado Plateau Physiographic Province (Stokes 1977) and is characterized by broken topography ranging in elevation from 4580 feet to 6000 feet above sea level. Most of the project area is flat to rolling terrain, broken by steep-sided mesas, and dissected by intermittent washes and arroyos which feed the San Juan River. The San Juan River is the nearest permanent water source.

The surface geology is reflected in the general broken nature of the landscape. The lower flatlands are fluvial sandstones and mudstones of the Recapture Creek member of the Morrison Formation, which is generally covered by wind blown silts and sands with patches of soil and alluvium (Hintze and Stokes 1964). The lower, light-colored Bluff Sandstone Formation is exposed along Desert Creek (at the east edge of the project area) and portions of Blue Hogan Wash (Hintze and Stokes 1964). The mesas are comprised of the Westwater Canyon and Brushy Basin Members of the Morrison Formation; the later is a dinosaur-bearing, fluvial and lacustrine mudstone and siltstone (Hintze and Stokes 1964) which often contains chert deposits. The coal-bearing sandstone and carbonaceous shales of the Dakota Sandstone cap the higher mesa tops.

The vegetation is in the cool desert climates classified as the Upper Sonoran Life Zone and is characterized by a shadscale (salt desert shrub) plant community. The vegetation noted during the survey included snakeweed, rabbitbrush, shadscale, Mormon tea, big sagebrush, greasewood, saltbush, narrow-leaf yucca, prickly pear cactus, galleta grass, Indian rice grass, cheat grass, locoweed, and Russian thistle. Today, the project area supports a fairly large population of domesticated grazers: sheep, horses, and cattle. Non-domesticates noted during the survey were rabbits, rodents, lizards, and unidentified birds.

CULTURE HISTORY

Broad overviews have been written, synthesizing the known culture history of southeastern Utah (see Nickens 1982, Weber 1982) and of northwestern New Mexico (see Stuart and Gauthier 1981). In general, the San Juan Basin, as was much of the Colorado Plateau, was inhabited prehistorically by the Basketmakers and Anasazi, relatively sedentary people who first incorporated horticulture into a hunting and gathering subsistence strategy, and later practiced agriculture. The Archaic hunter-gatherers and the earlier Paleo-Indian, mega-fauna hunters preceded the Basketmakers and Anasazi.

Historically the San Juan Basin, as was much of the Intermountain West, was inhabited by the Navajo and Ute. Although their entry into this area is as little understood as their early history, it is believed that their arrival barely preceded the Spanish Entrada during the 16th century (Wilcox 1981). From that time on, the area was visited by the Spanish, Anglo explorers, trappers, and traders, and later in the 19th century, by the Mormon settlers. Presently, much of the San Juan Basin, primarily the southern portion, is inhabited by the Navajo.

Archaeological surveys related to energy development to the east and northeast of the Rutherford Unit project (see Hewett et al 1979, Moore 1983, 1984, Swift 1984a, 1984b) have documented a variety of sites from artifact scatters to multiroom structures. Documented sites range from the Anasazi Pueblo I phase through recent Navajo. The highest site density occurs during the Anasazi Pueblo II phase, AD 900-1100. In the immediate project area, numerous isolated finds and Basketmaker II through Pueblo III and recent Navajo sites have been recorded (see Langenfeld and Hooten 1984, Langenfeld 1984).

METHODOLOGY

A total of 13 proposed well location sites and eight access routes were inventoried, along with portions of six flow line routes (above ground pipes). A total of 9.13 miles (48,200 feet) of proposed water injection line (buried pipeline) were also inventoried (Figures 2 and 3). Tables 3 and 4 describe the area surveyed. Each of the well location sites were staked prior to the survey, demarcating the 300 by 350 foot pad site. Each well location was inspected by walking parallel transects spaced 10 meters apart back and forth until the entire location was surveyed. An additional 100 foot (30 meter) buffer zone was also inspected around the staked well pad site.

The access roads and flow line routes were flagged while the archaeologist surveyed the well sites. No access routes were surveyed for well locations that were situated on or at the edge of existing maintained roads. Flow lines are to follow proposed and existing roads and existing flow line routes. Only the portions of proposed flow line routes that paralleled proposed access roads which have yet to be built were surveyed. A 100 foot right-of-way was surveyed by walking a zig-zag pattern along each flagged access route. If a flow line was to follow the access route, an additional 25 feet were inspected in the same manner.

The injection line routes were marked by lath stakes. A 50 foot right-of-way was inspected along the staked route, using the stakes as a center line. This was accomplished by walking a zig-zag pattern down one side of the line and back along the other.

All cultural materials encountered during the survey were noted, described, and often illustrated. Those cultural resources which lacked spacial integrity and the potential for interpretable past human behavior (Plog et al 1978) were noted as isolated finds.

In addition to the field inspection, a search of the site files at the Navajo Nation Cultural Resource Management Program in Window Rock, Arizona, was initiated by phone, August 13, 1984. A records search by the Utah Division of State History found no sites to have been previously recorded within the proposed project impact areas.

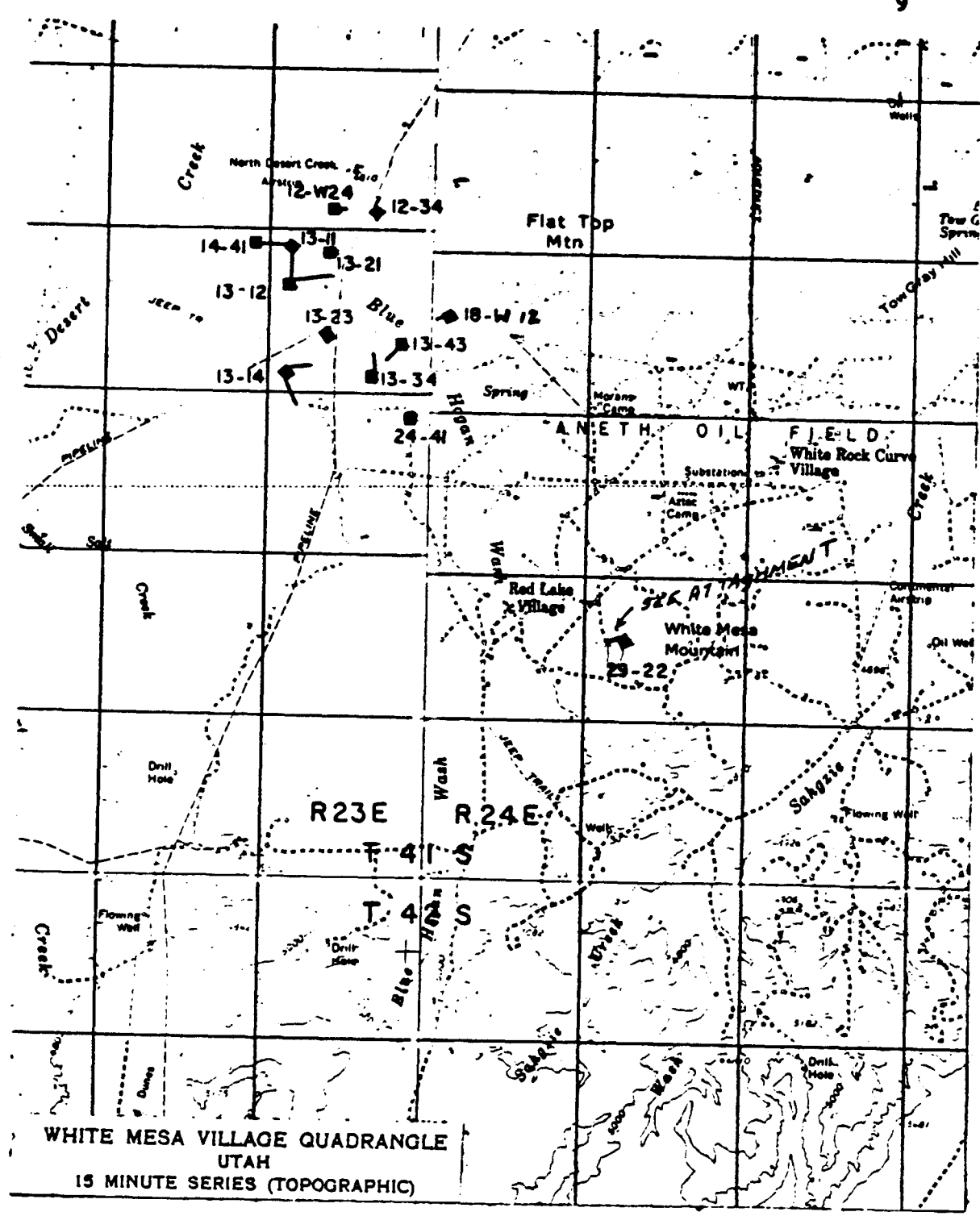


Figure 2. Locations of proposed well locations, access roads and flow line routes.

Map Scale: 1:62,500

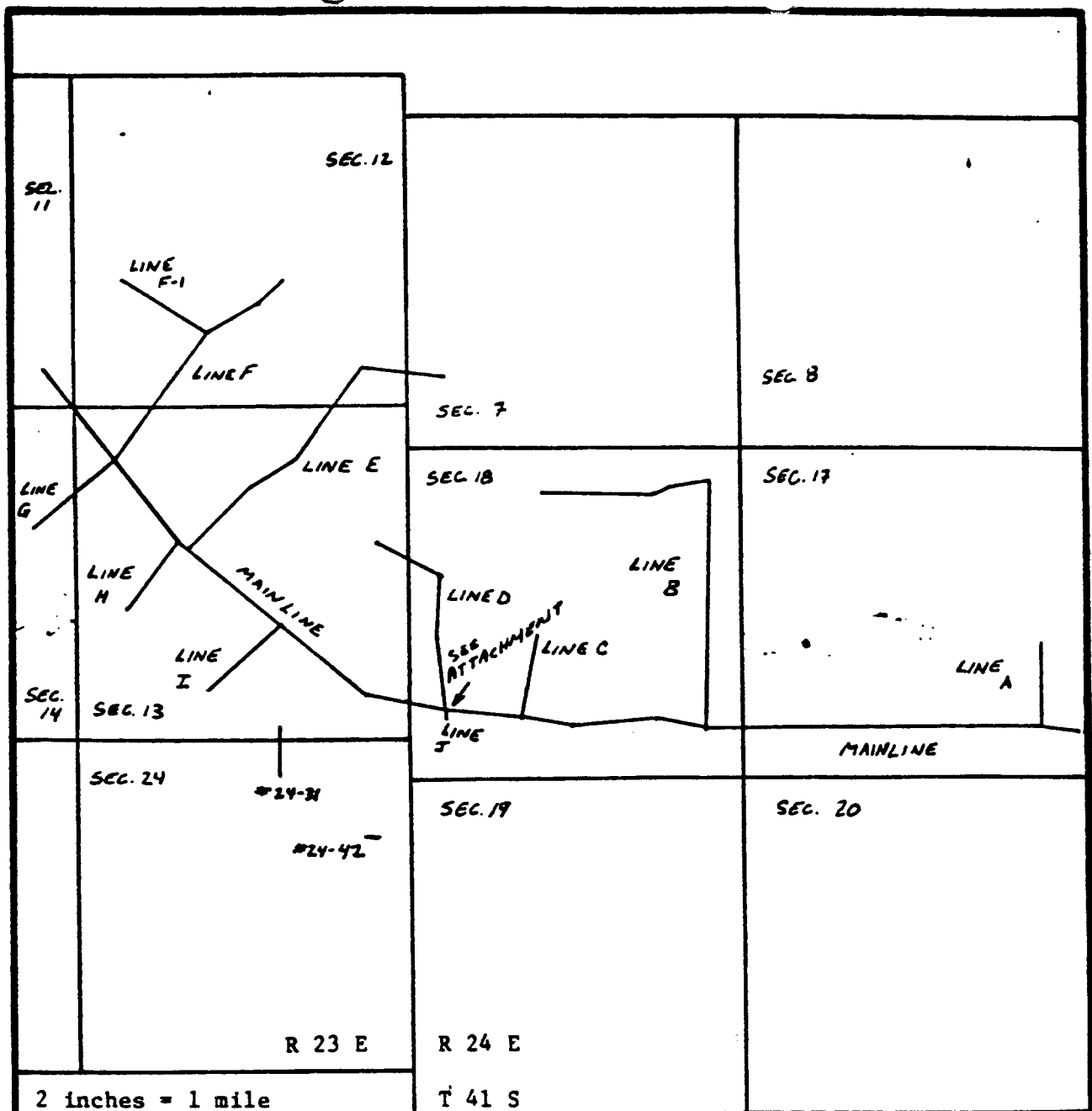


Figure 3. Location and routes of proposed water injection lines.

TABLE 3

Description of Well Pad Project Area and Area Surveyed

Well Pad	Project Area (square feet)	Area Surveyed (square feet)
12-W24	300 ft X 350 ft = 105,000 (2.41 acres) Access route = 300 ft	400 ft X 450 ft = 180,000 (4.13 acres) 300 ft X 100 ft = 30,000 (0.69 acres)
12-34	300 ft X 350 ft = 105,000 (2.41 acres) Access & flow line = 600 ft	400 ft X 450 ft = 180,000 (4.13 acres) 600 ft X 125 ft = 75,000 (1.72 acres)
14-41	300 ft X 350 ft = 105,000 (2.41 acres) Access & flow line = 1,000 ft	400 ft X 450 ft = 180,000 (4.13 acres) 1,000 ft X 125 ft = 125,000 (2.87 acres)
13-11	300 ft X 350 ft = 105,000 (2.41 acres) Access & flow line = 800 ft	400 ft X 450 ft = 180,000 (4.13 acres) 800 ft X 125 ft = 100,000 (2.30 acres)
13-12	300 ft X 350 ft = 105,000 (2.41 acres) Access & flow line = 1,300 ft	400 ft X 450 ft = 180,000 (4.13 acres) 1,300 ft X 125 ft = 162,500 (3.73 acres)
13-14	300 ft X 350 ft = 105,000 (2.41 acres) Access route = 800 ft Flow line = 700 ft	400 ft X 450 ft = 180,000 (4.13 acres) 800 ft X 125 ft = 100,000 (2.30 acres) 700 ft X 100 ft = 70,000 (1.61 acres)
13-21	300 ft X 350 ft = 105,000 (2.41 acres) No access or flow line surveyed	400 ft X 450 ft = 180,000 (4.13 acres)
13-23	300 ft X 350 ft = 105,000 (2.41 acres) No access or flow line surveyed	400 ft X 450 = 180,000 (4.13 acres)
13-34	300 ft X 350 ft = 105,000 (2.41 acres) Access and flow line = 600 ft	400 ft X 450 ft = 180,000 (4.13 acres) 600 ft X 125 ft = 75,000 (1.72 acres)

TABLE 3, continued

Well Pad	Project Area (square feet)	Area Surveyed (square feet)
13-43	300 ft X 350 ft = 105,000 (2.41 acres) Access & flow line = 600 ft	400 ft X 450 ft = 180,000 (4.13 acres) 600 ft X 125 ft = 75,000 (1.72 acres)
18-W12	300 ft X 350 ft = 105,000 (2.41 acres) Access & flow line = 500 ft	400 ft X 450 ft = 180,000 (4.13 acres) 500 ft X 125 ft = 62,500 (1.43 acres)
24-41	300 ft X 350 ft = 105,000 (2.41 acres) No access or flow line surveyed	400 ft X 450 ft = 180,000 (4.13 acres)
29-22	300 ft X 350 ft = 105,000 (2.41 acres) Access & flow line = 900 ft	400 ft X 450 ft = 180,000 (4.13 acres) 900 ft X 125 ft = 112,500 (2.58 acres)

Note: The figures for access route and flow line lengths are only for the portions that cross undisturbed areas. Portions that follow maintained roads or existing flow line routes were not surveyed and those figures are not provided here.

TABLE 4

Description of Water Injection Pipeline Project Length and Area Surveyed

Line	Project Length	Area Surveyed (square feet)
Main	18,500 feet	18,500 ft X 50 ft = 925,000 (21.23 acres)
A	1,250 feet	1,250 ft X 50 ft = 62,500 (1.43 acres)
B	6,900 feet	6,900 ft X 50 ft = 345,000 (7.92 acres)
C	1,400 feet	1,400 ft X 50 ft = 70,000 (1.61 acres)
D	3,250 feet	3,250 ft X 50 ft = 162,500 (3.73 acres)
E	5,500 feet	5,500 ft X 50 ft = 275,000 (6.31 acres)
F	3,850 feet	3,850 ft X 50 ft = 192,500 (4.42 acres)
F-1	1,500 feet	1,500 ft X 50 ft = 75,000 (1.72 acres)
G	1,700 feet	1,700 ft X 50 ft = 85,000 (1.95 acres)
H	1,500 feet	1,500 ft X 50 ft = 75,000 (1.72 acres)
I	1,700 feet	1,700 ft X 50 ft = 85,000 (1.95 acres)
J	300 feet	300 ft X 50 ft = 15,000 (0.34 acres)
Line runs north from 24-31	750 feet	750 ft X 50 ft = 37,500 (0.86 acres)
Line runs east from 24-42	100 feet	Not surveyed, entirely within existing well pad location

RESULTS

One archaeological site and 17 isolated finds were encountered during the survey. The archaeological site, a Basketmaker II to Pueblo I lithic scatter (SJC-1106) had been previously recorded by San Juan College Cultural Resources Management Program (see appendix for site description). The site had been located during the survey of a proposed access route to Phillips Oil Company's proposed well location # 18-24, and relocated during the survey of the Phillips Oil Company proposed injection line pipeline. The site was encountered at the junction of the mainline and line J (Figure 4).

SEE ATTACHMENT
The injection line crosses through the extreme southwest portion of the site, where it has been disturbed by previous pipeline and road construction. Four pieces of lithic debitage were encountered in the pipeline right-of-way outside of the disturbed area. These artifacts appear to be surficial. Resurvey of the site area found artifact concentrations to occur in the existing roadway and bladed pipeline valve area. Approximately 20 pieces of lithic debitage, one biface, one uniface (chopper), and two unidentified Mesa Verde white ware sherds (7 mm thick with sand temper) were noted during the resurvey. Note: the projectile point fragments were not relocated. The integrity of these deposits has been greatly disturbed by blading activities. Despite the disturbed nature of the site, the potential for buried deposits remains. Also, there is good probability that the site is multicomponent due to the presence of the Archaic diagnostic and the relatively late Puebloan white ware ceramics.

Two alternatives are proposed for this 100 meter section of the pipeline: (1) to build the injection line where proposed with an archaeologist monitoring the construction activities, or (2) to reroute the mainline in order to avoid the site area. This alternative would require an archaeologist to survey the new route.

The remaining cultural materials were isolated finds. A total of 17 isolated finds were encountered during the survey. All are surficial occurrences and are described in Table 5.

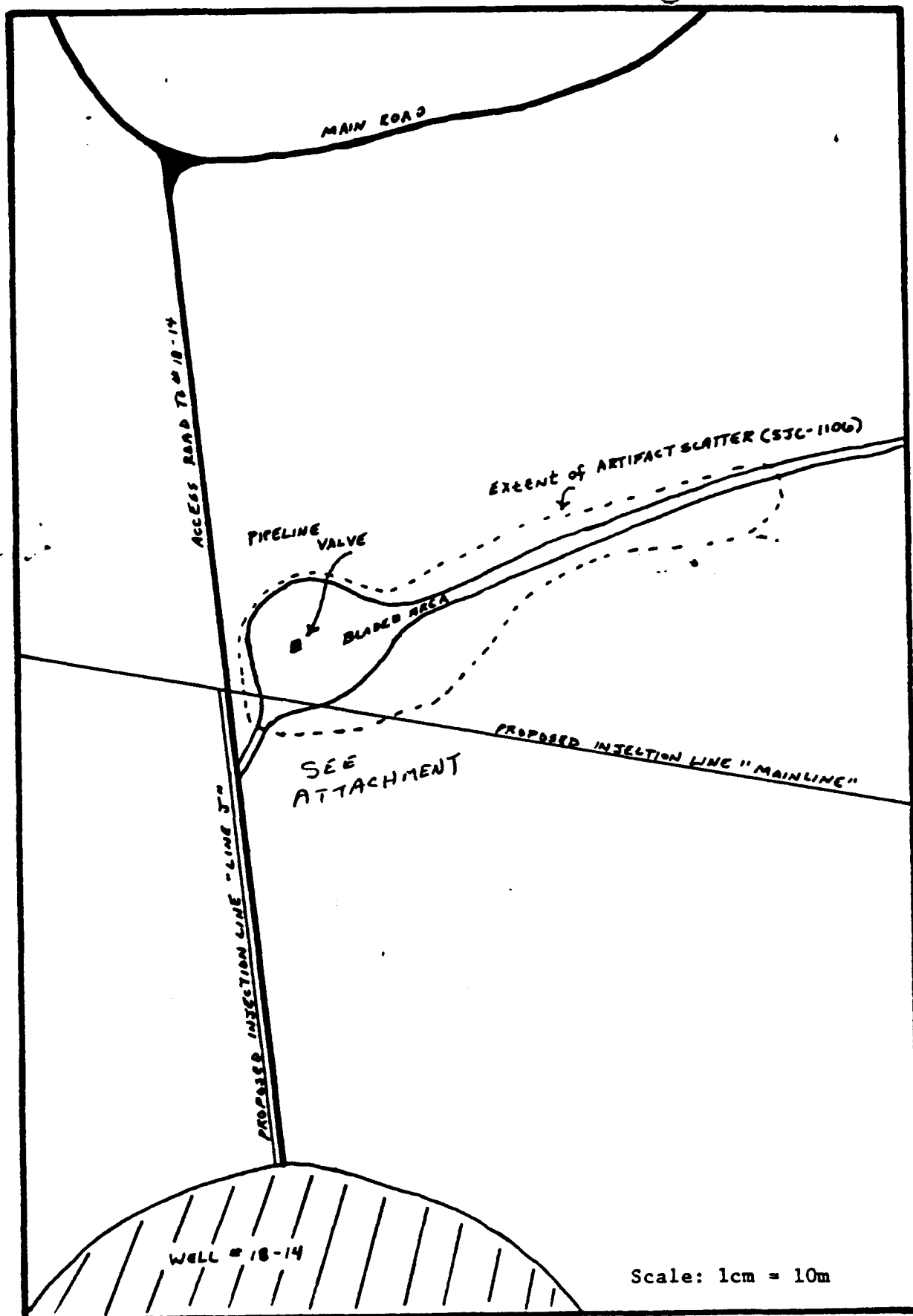


Figure 4. Map showing relationship of proposed injection line route and archaeological site - SJC-1106. Site Location: Center of E 1/2, W 1/2, SW 1/2 of Section 18, T 41 S - R 24 E, San Juan County, Utah.

TABLE 5

Isolated Finds from Phillips Oil Rutherford Unit Project
Legal Locations and Descriptions

Number	Legal Location	Description
RU # A	CTSESW Sec.12 T41S R23E UTM: 647,000 m E 4,121,825 m N	On location 12-W24. Isolated features: semi-circular, slab feature and two slab piles; a broken cup saucer found inside--white ovenware, modern; unidentified pipe fragments, wire and sole of shoe.
RU # B	CTNENW Sec.13 T41S R23E UTM: 647,000 m E 4,121,400 m N	13-21. 3 gray-green chert, interior core reduction flakes.
RU # C	CTNWNW Sec.13 T41S R23E UTM: 646,600 m E 4,121,950 m N	13-11. Gray and red quartzite cobble tool; 3 flakes removed.
RU # D	CTNWSW Sec.13 T41S R23E UTM: 647,000 m E 4,120,600 m N	*13-23. Biface with crude, heavily weathered flake scars, material type is light and dark gray mottled chert with tan cortex.
RU # E	NWSWSE Sec.13 T41S R23E UTM: 647,690 m E 4,120,400 m N	Access road to 13-34. 4 unidentified corrugated sherds; 4 recent Pepsi bottles.
RU # F	CTSWSE Sec.13 T41S R23E UTM: 647,700 m E 4,120,200 m N	*13-43. 1 crude olive-green oolitic chert biface.
RU # G	NENENE Sec.14 T41S R23E UTM: 646,250 m E 4,121,950 m N	1 Mesa Verde white ware sherd.
RU # H	NENWNW Sec.13 T41S R23E UTM: 646,775 m E 4,121,550 m N	*Injection line 12-24 to 13-11. 1 grainy, tan to yellow chert uniface with heavily weathered, yellowish patina; flake scars are smooth.
RU # I	NWNWNE Sec.18 T41S R24E UTM: 648,950 m E 4,121,325 m N	18-21 to 18-41. 3 green quartzite interior core reduction flakes.

TABLE 5, continued

Number	Legal Location	Description
RU # J	NWSESE Sec.18 T41S R24E UTM: 649,300 m E 4,120,150 m N	18-44 to 18-34. 1 gray-tan quartzite, utilized, secondary reduction flake; 1 green quartzite secondary reduction flake.
RU # K	NESWSW Sec.18 T41S R24E UTM: 648,450 m E 4,120,175 m N	18-34 to 18-14. 1 white quartzite, tertiary reduction flake; 1 green-gray quartzite, tertiary reduction flake.
RU # L	NWSWSE Sec.17 T41S R24E UTM: 650,400 m E 4,120,100 m N	17-14 to 17-44. 2 white chert, interior core reduction flakes.
RU # M	SWNWSW Sec.18 T41S R24E UTM: 648,200 m E 4,120,350 m N	18-13 to 18-14. 4 gray quartzite, secondary reduction flakes.
RU # N	NWSESE Sec.13 T41S R23E UTM: 647,700 m E 4,120,350 m N	13-33 to 13-44. 3* gray-green quartzite, interior core reduction flakes; 1 secondary reduction flake.
RU # O	SESENW Sec.13 T41S R23E UTM: 647,025 m E 4,121,000 m N	*13-22 to 13-33. 1 green chert uniface with brown patina; 1 tan quartzite, tertiary reduction flake.
RU # P	SWSESE Sec.12 T41S R23E UTM: 647,700 m E 4,121,725 m N	*13-31 to 12-44. 1 green-gray quartzite uniface.
RU # Q	NESESE Sec.13 T41S R23E UTM: 647,075 m E 4,121,100 m N	*13-22 to 13-31. 1 gray quartzite uniface with tan to brown patina.

* illustrated isolated finds.

note: all UTM coordinates are in zone 12.

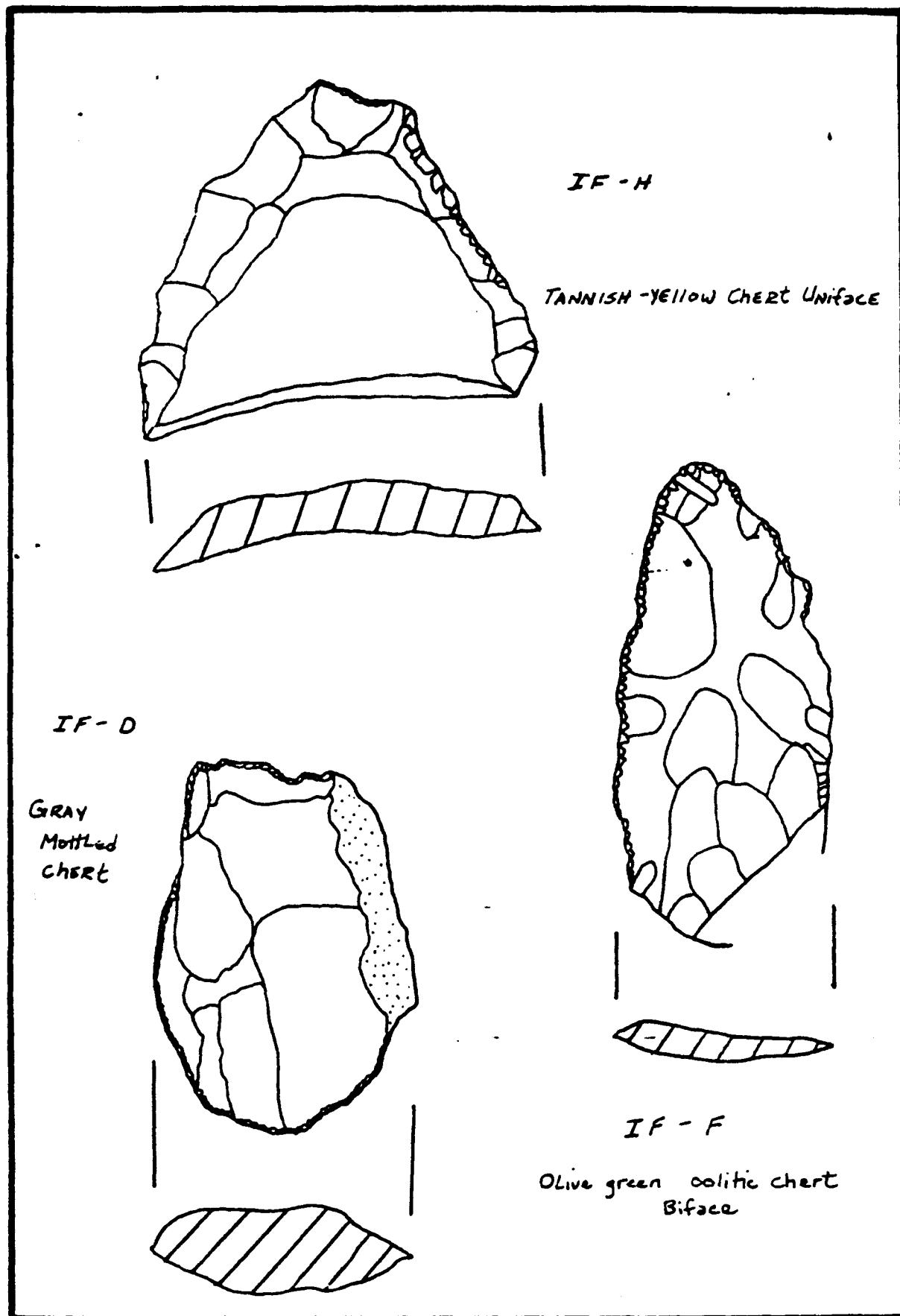


Figure 5. Flaked Stone Tools

IF #0

GREEN Chert Uniface

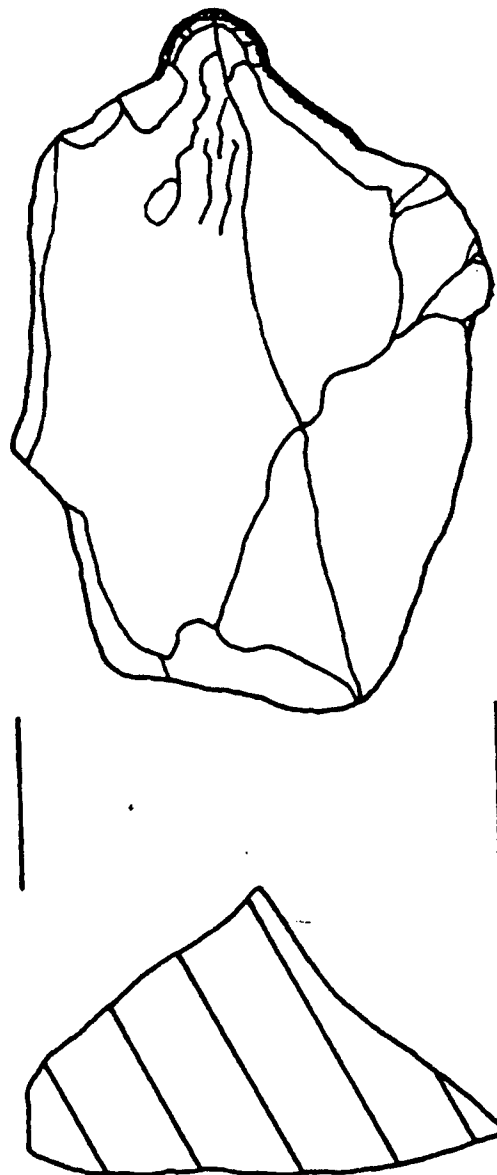


Figure 6. Flaked Stone Tool

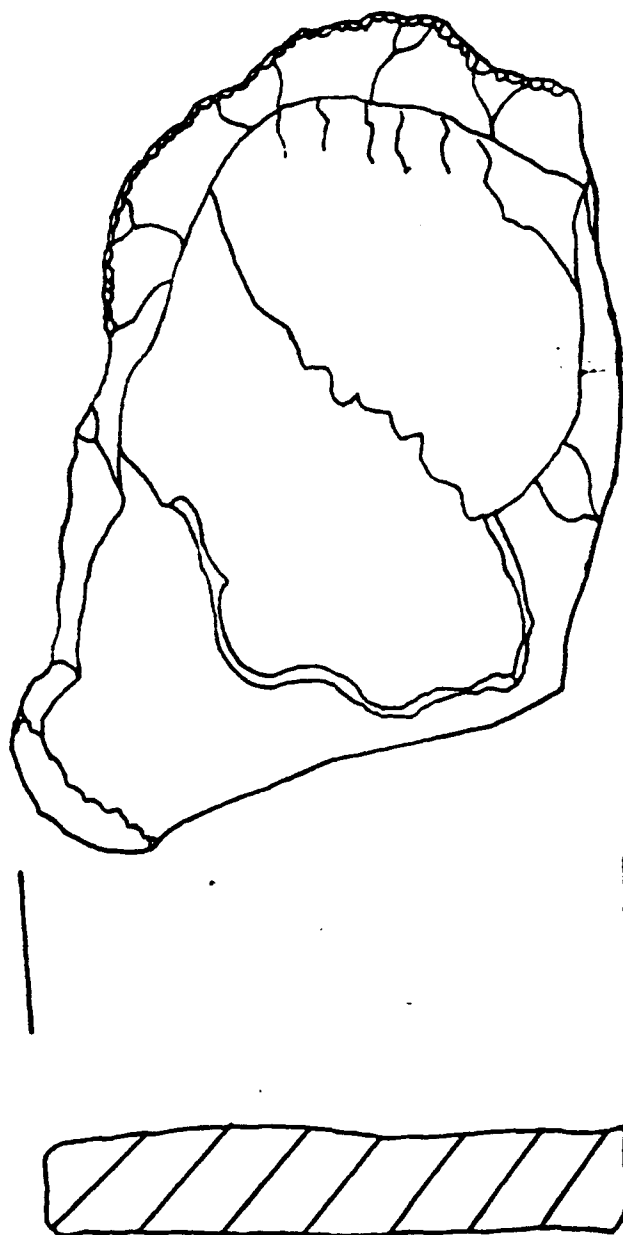
*IF - P**Greenish-gray quartzite Uniface*

Figure 7. Flaked Stone Tool

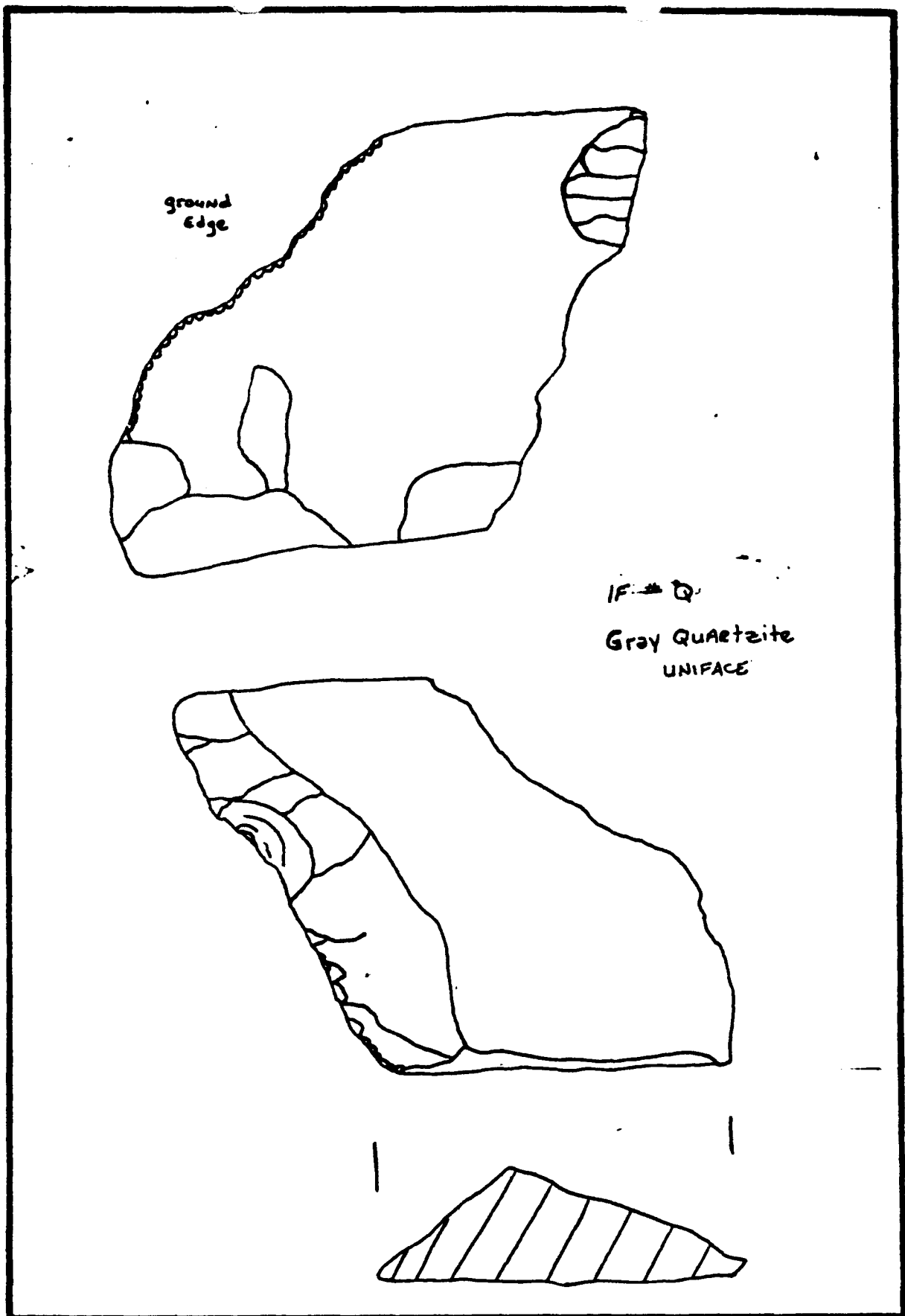


Figure 8. Flaked Stone Tool

RECOMMENDATIONS

SEE ATTACHMENT

One potentially significant archaeological site was encountered during the survey. As outlined in section "Results", the 100 meters of injection line (the mainline) west of line J can either be constructed as planned or rerouted. If the line is positioned as proposed, an archaeologist should be present to monitor construction of the 100 meters of mainline injection pipeline, extending east from line J. In the event that buried cultural deposits are encountered, construction should stop and the BIA area archaeologist be notified. The other alternative would be to reroute a portion of the mainline in order to avoid the site. An archaeological clearance would be needed if a new route is proposed. ← New route has been surveyed
SEE ATTACHMENT

The remaining cultural resources encountered during the survey were isolated finds which indicate prehistoric and modern use of the area. Most of these are the waste products from flint knapping activities. Several unifacial tools and one biface were also found. Recordation has exhausted the research potential of these isolated finds. Archaeological clearance is recommended for the proposed Rutherford Unit development project well locations, associated access roads and flow lines, and for the proposed injection line routes: mainline and lines A, B, C, D, E, F, F-1, G, H, I, and J, except for the 100 meter of mainline extending east from its junction with line J.

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Plog, Steven, Fred Plog and Walter Wait

- 1978 "Decision Making in Modern Surveys", IN Advances in Archaeological Method and Theory, Vol.1, edited by M.B. Schiffer, pp. 383-421. Academic Press, New York.

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- 1977 "Subdivision of the Major Physiographic Provinces in Utah". Utah Geology 4(1).

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Swift, Marilyn

- 1984a An Archaeological Survey of Satellite Area A and a Pipeline Easement for Well I-12 in the White Mesa Unit, San Juan County, Utah. Division of Conservation Archaeology, San Juan County Museum Association. Farmington, New Mexico.

- 1984b An Archaeological Survey of Six Pipeline Easements to Wells K-20, K-22, K-24, L-23, M-18, and M-20 in Sections 7, 18, and 19, T41S, R25E, San Juan County, Utah. Division of Conservation Archaeology, San Juan County Museum Association. Farmington, New Mexico.

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OPERATOR Phillips Oil Co. DATE 3-14-85
WELL NAME Rutherford Unit #18-12
SEC SW NW 18 T 41S R 24E COUNTY San Juan

43-037-31153
API NUMBER

Indian
TYPE OF LEASE

CHECK OFF:



PLAT



BOND



NEAREST WELL



LEASE



FIELD



POTASH OR
OIL SHALE

PROCESSING COMMENTS:

Unit well - a BLM Farmington
Need water permit

APPROVAL LETTER:

SPACING:



A-3

Rutherford
UNIT



c-3-a

CAUSE NO. & DATE



c-3-b



c-3-c

STIPULATIONS:

1- Water



STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

March 15, 1985

Phillips Oil Company
P. O. Box 2920
Casper, Wyoming 82602

Gentlemen:

Re: Well No. Ratherford Unit #18-12 - SW NW Sec. 18, T. 41S, R. 24E
1980' FNL, 560' FWL - San Juan County, Utah

Approval to drill the above referenced oil well is hereby granted in accordance with Section 40-6-18, Utah Code Annotated, as amended 1983; and predicated on Rule A-3, General Rules and Regulations and Rules of Practice and Procedure, subject to the following stipulations:

1. Prior to commencement of drilling, receipt by the Division of evidence providing assurance of an adequate and approved supply of water.

In addition, the following actions are necessary to fully comply with this approval:

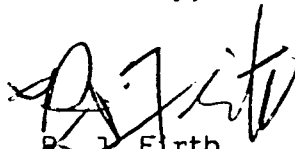
1. Spudding notification to the Division within 24 hours after drilling operations commence.
2. Submittal to the Division of completed Form OGC-8-X, Report of Water Encountered During Drilling.
3. Prompt notification to the Division should you determine that it is necessary to plug and abandon this well. Notify John R. Baza, Petroleum Engineer, (Office) (801) 538-5340, (Home) 298-7695 or R. J. Firth, Associate Director, (Home) 571-6068.
4. Compliance with the requirements and regulations of Rule C-27, Associated Gas Flaring, General Rules and Regulations, Oil and Gas Conservation.

Page 2
Phillips Oil Company
Well No. Ratherford Unit #18-12
March 15, 1985

5. This approval shall expire one (1) year after date of issuance unless substantial and continuous operation is underway or an application for an extension is made prior to the approval expiration date.

The API number assigned to this well is 43-037-31153.

Sincerely,

A handwritten signature in dark ink, appearing to read "R. J. Firth", is written over the typed name.

R. J. Firth
Associate Director, Oil & Gas

as
Enclosures
cc: Branch of Fluid Minerals
Bureau of Indian Affairs

DIVISION OF OIL, GAS AND MINING

SPUDDING INFORMATION

API #43-037-31153

NAME OF COMPANY: PHILLIPS OIL COMPANYWELL NAME: Ratherford Unit #18-12SECTION SW NW 18 TOWNSHIP 41S RANGE 24E COUNTY San JuanDRILLING CONTRACTOR L. C. JonesRIG # SPUDDED: DATE 7-11-85TIME 8:00 AMHOW Rat Hole DiggerDRILLING WILL COMMENCE Four Corner #9 - 7-14-85REPORTED BY Jack PerraultTELEPHONE # 651-3471DATE 7-16-85 SIGNED AS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well ☒ gas well ☐ other ☐ JUL 22 1985

2. NAME OF OPERATOR
Phillips Oil Company DIVISION OF OIL
GAS & MINING

3. ADDRESS OF OPERATOR
8055 E. Tufts Ave., Denver, CO 80237

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 1980' FNL, 560' FWL (SW/NW)
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

REQUEST FOR APPROVAL TO: SUBSEQUENT REPORT OF:

TEST WATER SHUT-OFF	<input type="checkbox"/>	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>	<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>	<input type="checkbox"/>
PULL OR ALTER CASING	<input type="checkbox"/>	<input type="checkbox"/>
MULTIPLE COMPLETE	<input type="checkbox"/>	<input type="checkbox"/>
CHANGE ZONES	<input type="checkbox"/>	<input type="checkbox"/>
ABANDON*	<input type="checkbox"/>	<input type="checkbox"/>
(other)	<input type="checkbox"/>	<input type="checkbox"/>

5. LEASE
14-20-603-353

6. IF INDIAN, ALLOTTEE OR TRIBE NAME
Navajo

7. UNIT AGREEMENT NAME
SW-I-4192

8. FARM OR LEASE NAME
Ratherford Unit

9. WELL NO.
#18-12W

10. FIELD OR WILDCAT NAME
Greater Aneth

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec. 18-T41S-R24E

12. COUNTY OR PARISH
San Juan

13. STATE
Utah

14. API NO.
43-037-31153

15. ELEVATIONS (SHOW DF, KDB, AND WD)
4675 ung. G.L.

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Drilled 17-1/2" conductor hole to 120' G.L. on 7-10-85. Ran 122' 13-3/8" 54.5# K-55 ST&C casing. Set at 122'. cemented with 177 cu.ft. (150 sx) Class B to surface. Finished job and moved out rat hole driller 7-10-85.

Spudded well 7-14-85 with Four Corners Drilling Rig #9. Drilled 12-1/4" hole to 1537'. Ran 9-5/8" 36# K-55 ST&C, set at 1537'. Cemented with 726 cu.ft. (300 sx) Class B w/20% Diacel D; tailed with 354 cu.ft. (300 sx) Class B. Circulated to surface. Job complete 7-16-85.

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct

SIGNED Healdce Butz TITLE Drilling Manager DATE July 17, 1985

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

6 - BLM, Farmington, NM
2 - Utah O&GCC, SLC
1 - Casper
1 - File (RC)
1 - J. Weichbrodt

1 - Chevron USA, Inc.
1 - Mobil Oil Corp.
1 - Texaco, Inc.
*See Instructions on Reverse Side
1 - Shell Oil Co.

UNITED STATES
DEPARTMENT OF THE INTERIOR -
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

- AUG 01 1985
1. oil ☒ gas ☐ other ☐
well well
2. NAME OF OPERATOR Phillips Oil Company
DIVISION OF OIL
GAS & MINING
3. ADDRESS OF OPERATOR
8055 E. Tufts Ave., Denver, CO 80237
4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 1980' FNL, 560' FWL (SW/NW)
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:
16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

REQUEST FOR APPROVAL TO:

TEST WATER SHUT-OFF ☐
FRACTURE TREAT ☐
SHOOT OR ACIDIZE ☐
REPAIR WELL ☐
PULL OR ALTER CASING ☐
MULTIPLE COMPLETE ☐
CHANGE ZONES ☐
ABANDON* ☐
(other) ☐

SUBSEQUENT REPORT OF:

☐
☐
☐
☐
☐
☐
☐
☐
☐

5. LEASE
14-20-603-353
6. IF INDIAN, ALLOTTEE OR TRIBE NAME
Navajo
7. UNIT AGREEMENT NAME
SW-I-4192
8. FARM OR LEASE NAME
Ratherford Unit
9. WELL NO.
#18-12W
10. FIELD OR WILDCAT NAME
Greater Aneth
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec. 18-T41S, R24E
12. COUNTY OR PARISH
San Juan
13. STATE
Utah
14. API NO.
43-037-31153
15. ELEVATIONS (SHOW DF, KDB, AND WD)
4675 ung. G.L.

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Drilled 8-3/4" hole to 5545'. Ran 7" 23# & 26#, K-55 & S-95 LT&C & Butt casing; cemented with 1144 cu.ft. (400 sx) Class B w/20% Diacel D. Tailed with 360 cu.ft. (300 sx) Class B w/19% salt; set at 5542.6'. Pressure tested casing to 1500 psi. Job completed 7-27-85. Plug back total depth: 5545'.

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct

SIGNED [Signature] TITLE Drilling Director DATE July 29, 1985

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

6-BLM, Farmington, NM
2-Utah O&GCC, SLC
1-Casper
1-File (RC)
1-J. Weichbrodt

1-Chevron USA, INC.
1-Mobil Oil Corp.
1-Texaco, Inc.
1-Shell Oil Co.

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN DUPLICATE

Form approved.
Budget Bureau No. 1004-0137
Expires August 31, 1985

WELL COMPLETION OR RECOMPLETION REPORT AND LOG *

1. TYPE OF WELL: OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> DRY <input type="checkbox"/> Other _____		5. NAME, DESIGNATION AND SERIAL NO. 14-20-603-353	
2. TYPE OF COMPLETION: NEW WELL <input checked="" type="checkbox"/> WORK OVER <input type="checkbox"/> REPAIR <input type="checkbox"/> PLUG BACK <input type="checkbox"/> DIFF. REPAIR <input type="checkbox"/> Other _____		6. IF INDIAN, ALLOTTEE OR TRIBE NAME Navajo	
3. NAME OF OPERATOR Phillips Petroleum Company		7. UNIT AGREEMENT NAME SW-I-4192	
4. ADDRESS OF OPERATOR P.O. Box 2920, Casper, Wyoming 82602		8. FARM OR LEASE NAME Ratherford Unit	
9. LOCATION OF WELL (Report location clearly and in accordance with any State requirements): At surface 1980' FNL & 560' FWL, SW NW At top prod. interval reported below At total depth		9. WELL NO. 18-12	
10. FIELD AND POOL, OR WILDCAT Greater Aneth		11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA Sec. 18-T41S-R24E	
12. PERMIT NO. API #43-037-31153		13. COUNTY OR PARISH San Juan	
14. DATE ISSUED GAS & MISC. 3-15-85		15. STATE Utah	
15. DATE SPUDDED 7/14/85	16. DATE T.D. REACHED 7/25/85	17. DATE COMPL. (Ready to prod.) 8/22/85	18. ELEVATIONS (DF, RKB, RT, OR, ETC.) * GR 4675', RKB 4686.5'
19. ELEV. CASINGHEAD --	20. TOTAL DEPTH, MD & TVD 5545'	21. PLUG BACK T.D., MD & TVD 5517'	22. IF MULTIPLE COMPL., HOW MANY? --
23. INTERVALS DRILLED BY --	24. ROTARY TOOLS 0 - 5545'	25. CABLE TOOLS --	26. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD) * 5478-5491' Desert Creek Zone I
27. TYPE ELECTRIC AND OTHER LOGS RUN DSN-CDL, Contact Caliper, Dual Guard Forxo			28. WAS DIRECTIONAL SURVEY MADE No
29. WAS WELL CORRED No			
30. CASING RECORD (Report all strings set in well)			
CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE
13-3/8"	54.5#	122'	17-1/2"
9-5/8"	36#	1537'	12-1/4"
7"	23# & 26#	5542.6'	8-3/4"
CEMENTING RECORD			
177 cu. ft. Class B			
1080 cu. ft. Class B			
1504 cu. ft. Class B			
AMOUNT PULLED --			
31. LINER RECORD			
SIZE	TOP (MD)	BOTTOM (MD)	BACKS CEMENT*
--	--	--	--
32. TUBING RECORD			
SIZE	DEPTH SET (MD)	PACKER SET (MD)	
2-7/8"	5336'	--	
33. PERFORATION RECORD (Interval, size and number) 5478-5491', 2 SPF, 4" gun, 26 shots			
34. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.			
DEPTH INTERVAL (MD)		AMOUNT AND KIND OF MATERIAL USED	
5478-5491'		Acidized w/1600 gal 28% HCL	
w/2 gal/1000 F-801, 3 gal/1000 W-802, 1 gal/1000			
A-250 & 6 gal/1000 U-42, w/37, 1.2 sp. gr.,			
ball sealers. Good ball action.			
35. PRODUCTION			
DATE FIRST PRODUCTION 8/22/85	PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump) Pumping - RHBM 2-1/2" x 1-3/4" x 15'		WELL STATUS (Producing or shut-in) Producing
DATE OF TEST 10/2/85	HOURS TESTED 24	CHOKER SIZE --	PROD'N. FOR TEST PERIOD --
FLOW. TUBING PRESS. 40	CASING PRESSURE 30	CALCULATED 24-HOUR RATE --	OIL—BSL. 57
GAS—MCF. 23		WATER—BSL. 6	GAS-OIL RATIO 400
OIL GRAVITY-API (CORR.) 40.0			
36. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.) Sold			
37. TEST WITNESSED BY --			
38. LIST OF ATTACHMENTS None			
39. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records			
SIGNED D. C. GILL		TITLE Area Manager	
DATE 10/3/85			

*(See Instructions and Spaces for Additional Data on Reverse Side)

37. SUMMARY OF POROUS ZONES: (Show all important zones of porosity and contents thereof; cored intervals; and all drill-stem, tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures, and recoveries):

38. GEOLOGIC MARKERS

FORMATION	TOP	BOTTOM	DESCRIPTION, CONTENTS, ETC.	NAME	TOP	
					MEAS. DEPTH	TRUE VERT. DEPTH
No Cores or DST'S Run.				Shinarump	LOG TOPS	2210'
				DeChelly		2548'
				Hermosa		4462'
				Ismay		5305'
				Desert Creek Zone I		5471'
DISTRIBUTION						
4 - BLM, Farmington, New Mexico						
2 - Utah O&G CC, Salt Lake City, Utah						
1 - The Navajo Nation, Window Rock, Arizona						
1 - R. Ewing, B'ville						
1 - L. R. Williamson r) G. W. Berk, Denver						
1 - T. L. Carten r) P. Bertuzzi, Denver						
1 - J. B. Lindemood, Denver						
16 - Working Interest Owners						
1 - J. Weichbrodt, Cortez						
1 - File RC						

UIC CHECKLIST FOR APPLICATION APPROVAL

OPERATOR Phillips Petroleum WELL NUMBER 18-12

SEC. 18 T. 41S R. 24E COUNTY San Juan Co.

API # 43-037-31153

NEW WELL DISPOSAL WELL ENHANCED RECOVERY WELL ✓

- | | | |
|----------------------------------|-------------------|------------------|
| - Plat showing surface ownership | Yes <u> </u> | No <u>✓</u> |
| - Application forms complete | Yes <u>✓</u> | No <u> </u> |
| - Schematic of well bore | Yes <u>✓</u> | No <u> </u> |
| - Adequate geologic information | Yes * <u>✓</u> | No <u> </u> |
| - Rate and Pressure information | Yes * <u>✓</u> | No <u> </u> |
| - Fluid source | Yes * <u>✓</u> | No <u> </u> |
| - Analysis of formation fluid | Yes * <u>✓</u> | No <u> </u> |
| - Analysis of injection fluid | Yes * <u>✓</u> | No <u> </u> |
| - USDW information | Yes * <u>✓</u> | No <u> </u> |
| - Mechanical integrity test | Yes ** <u>✓</u> | No <u> </u> |

Number of wells in 1/2 mile review: PA 0 Prod 6 Inj. 4

Comments: 500 BWP, 3000 psig

13 3/8" surface, 9 5/8" intermediate, 7" production

** [Pressure tested casing to 1500 psi 7/27/85]

* Info submitted Feb. 1986

Reviewed by Dorothy Swindell 8/20/86

Operator

Phillips Petroleum

Well

Rutherford Unit 18-12

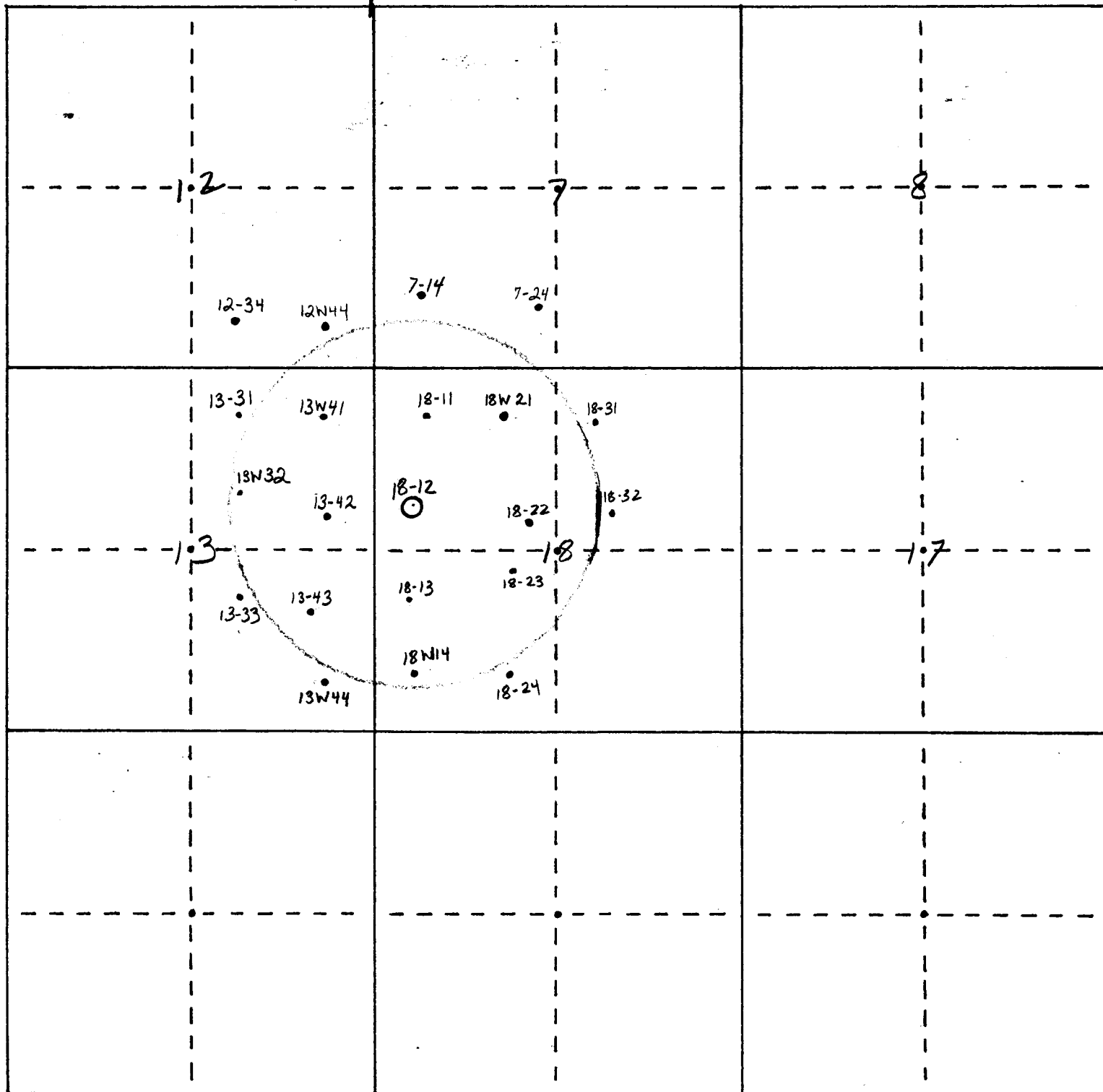
Location

1980 FNL, 560 FWL

Sec. 18, T 41S, R 24E

23E

24E





STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

September 11, 1986

San Juan Record
P.O. Box 879
937 East Highway 666
Monticello, Utah 84535

Gentlemen:

RE: Cause No. UIC-087

Enclosed is a Notice of Application of Administrative Approval before the Division of Oil, Gas and Mining, Department of Natural Resources, State of Utah.

It is requested that this notice be published ONCE ONLY, as soon as possible, but no later than the 24th day of September, 1986. In the event that said notice cannot be published by this date, please notify me immediately by calling 538-5340.

Upon completion of this request, please send proof of publication and statement of cost to the Division of Oil, Gas and Mining, 355 West North Temple, 3 Triad Center, Suite 350, Salt Lake City, Utah 84180-1203.

Sincerely,

Marjorie L. Anderson
for
Marjorie L. Anderson
Administrative Assistant

mfp

Enclosure



STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

September 11, 1986

Newspaper Agency Corporation
Legal Advertising
143 South Main - Mezzanine Floor
Salt Lake City, Utah 84110

Gentlemen:

RE: Cause No. UIC-087

Enclosed is a Notice of Application of Administrative Approval before the Division of Oil, Gas and Mining, Department of Natural Resources, State of Utah.

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Sincerely,

Marjorie L. Anderson
for
Marjorie L. Anderson
Administrative Assistant

mfp

Enclosure

BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

---00000---

IN THE MATTER OF THE APPLICATION : CAUSE NO. UIC-087
OF PHILLIPS PETROLEUM COMPANY, :
FOR ADMINISTRATIVE APPROVAL TO :
INJECT FLUID INTO WELLS TO BE :
CONVERTED TO ENHANCED RECOVERY :
INJECTION WELLS LOCATED IN :
SECTIONS 11, 12, AND 13, TOWN- :
SHIP 41 SOUTH, RANGE 23 EAST; AND :
SECTIONS 8, 17 AND 18, TOWNSHIP :
41 SOUTH, RANGE 24 EAST, S.L.M., :
SAN JUAN COUNTY, UTAH :

---00000---

THE STATE OF UTAH TO ALL INTERESTED PARTIES IN THE ABOVE ENTITLED
MATTER.

Notice is hereby given that Phillips Petroleum Company, Box 2920,
Casper, Wyoming 82602, has requested administrative approval from the
Division to convert the following listed wells to enhanced recovery
water injection wells:

RATHERFORD UNIT - San Juan County, Utah

#11W42, Sec. 11, T41S, R23E	#13W22, Sec. 13, T41S, R23E
#12W11, Sec. 12, T41S, R23E	#13W33, Sec. 13, T41S, R23E
#12W24, Sec. 12, T41S, R23E	# 8W34, Sec. 8, T41S, R24E
#12W33, Sec. 12, T41S, R23E	#17W32, Sec. 17, T41S, R24E
#13W11, Sec. 13, T41S, R23E	#18W12, Sec. 18, T41S, R24E
#13W13, Sec. 13, T41S, R23E	

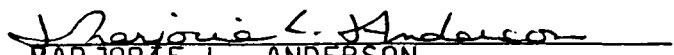
The proposed operating data for the wells is as follows:

INJECTION INTERVAL: Paradox Formation 5303' - 5548'
MAXIMUM ESTIMATED SURFACE PRESSURE: 3000 psig
MAXIMUM ESTIMATED WATER INJECTION RATE: 500 BWPD

Approval of this Application will be granted unless any objections
are filed with the Division of Oil, Gas and Mining within fifteen days
after publication of this Notice. Objections should be mailed to the
Division of Oil, Gas and Mining, Attention: UIC Program Manager, 355
West North Temple, 3 Triad Center, Suite 350, Salt Lake City, Utah
84180-1203.

DATED this 8th day of September, 1986.

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING


MARJORIE L. ANDERSON
Administrative Assistant



PHILLIPS PETROLEUM COMPANY

CASPER, WYOMING 82602
BOX 2920

EXPLORATION AND PRODUCTION GROUP

August 14, 1986

RECEIVED
AUG 15 1986

**DIVISION OF
OIL, GAS & MINING**

State of Utah
Division of Oil, Gas, and Mining
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Attn: Gil Hunt

RE: Ratherford Unit
San Juan County
Class II Injection Well
Conversions

Dear Mr. Hunt:

Enclosed are applications of conversions for the last eleven wells in the Ratherford Unit Conversion Program. The well numbers are:

	12-W11	13-W11	13-W33
8W34	12-W24	13-W13	17-W32
11W42	12-W33	13-W22	18-W12

We have listed, on each well bore schematic, the logs on file for that well. We have also enclosed a copy of our letters to mineral lease operators and landowners in the area informing them of these proposed well conversions. Please refer to the attachment package of February and June 1986 for other required information. Please contact Renee Taylor at (307) 237-3791 with any questions.

Thank you for your help in making this conversion program run smoothly.

Sincerely,

PHILLIPS PETROLEUM COMPANY

D. C. Gill
Area Manager

RCT/fb (23)

Attach

cc: B. J. Murphy - Casper w/o attach
J. R. Reno - Cortez w/attach.
Casper RC

RECEIVED
AUG 15 1986

APPLICATION FOR INJECTION WELL

**DIVISION OF
OIL, GAS & MINING**
(307) 237-3791

Operator: Phillips Petroleum Company Telephone: _____

Address: P. O. Box 2920

City: Casper State: Wyoming Zip: 82602

Well no.: 18 W12 Field or Unit name: Ratherford Unit

Sec.: 18 Twp.: 41S Rng.: 24E County: San Juan Lease no. 14-20-603-353

	<u>YES</u>	<u>NO</u>
Is this application for expansion of an existing project?.....	<u>X</u>	_____
Will the proposed well be used for: Enhanced recovery?.....	<u>X</u>	_____
Disposal?.....	_____	<u>X</u>
Storage?.....	_____	<u>X</u>
Is this application for a new well to be drilled?.....	_____	<u>X</u>
Has a casing test been performed for an existing well?.....	_____	<u>X</u>

(If yes, date of test: _____)

Injection interval: from 5478 to 5491

Maximum injection: rate 500 BWPD pressure 3000 psig

Injection zone contains X oil, X gas or _____ fresh water within 1/2 mile.

Additional information as required by Rule 502 should accompany this form.

I hereby certify that the foregoing is true and correct to the best of my knowledge:

Signed: D.C. Gill Title: Area Manager Date: 8/13/86
D.C. Gill

(This space for DOGM approval)

Approved by: _____ Title: _____ Date: _____

LOCATION: SWNW So 18 - T41S - R24 E

FIELD: GREATER ANETH

RESERVOIR: Desert Creek Zone I

COMPLETION: Injector
PRESENT STATUS: Conversion

RKB 4686
GL 4675

122'

SURFACE CASING: 13 3/8"
54.5 #

Well #: 18W12

INTERMEDIATE CASING: 9 5/8"
36 #

PRODUCTION CASING: 7"
23 # / 26 #

1537'

PERFORATIONS:

5478 - 5491

PACKER: Baker Model AB
Tension Type or Similar Act.
at 5378'

Logs on file: _____

Gamma Ray

Density Porosity

Neutron Porosity

Electrical Resistivity

Contact Caliper

Microlog

PBTD: 5517-

OTD: 5545

5542.6

Phillips Petroleum Company



PHILLIPS PETROLEUM COMPANY

CASPER, WYOMING 82602
Box 2920, Casper, Wyoming 82602
EXPLORATION AND PRODUCTION GROUP

August 14, 1986

Navajo Tribe
Department of Water Management
P. O. Box 308
Window Rock, AZ 86515

Attn: Masued Uz Zaman

Re: Ratherford Unit
Injection Well Conversions

Dear Sirs,

Phillips Petroleum Company has made application to the State of Utah, Division of Oil, Gas and Mining to convert eleven existing producing wells to water injection wells in the Ratherford Unit secondary recovery project. The revised rule 502(b)(12) requires that you are notified of these plans and are provided with a copy of the application for injection well (Form DOGM-UIC-1). Under Rule 503 you are provided with the opportunity to object to the proposed application.

"Applications for Injection Well" are attached for the following existing wells:

	12W11	13W11	13W33
8W34	12W24	13W13	17W32
11W42	12W33	13W22	18W12

Please contact Renee Taylor or Blair Murphy at (307) 237-3791 with any questions.

Sincerely,

Original Signed By:
D. C. GILL

D. C. Gill
Area Manager

RCT/fb (17)

cc: B. J. Murphy-Casper
J. R. Reno-Cortez
St. of Utah OG&M/UIC
Casper-RC



PHILLIPS PETROLEUM COMPANY

CASPER, WYOMING 82602

BOX 2920

P.O. Box 2920, Casper, Wyoming 82602

EXPLORATION AND PRODUCTION GROUP

August 14, 1986

Mobil Oil Corp.
P.O. Box 5444
Denver, CO 80217
Attn: Joint Interest Advisor

Re: Ratherford Unit
Injection Well Conversions

Dear Sirs,

Phillips Petroleum Company has made application to the State of Utah, Division of Oil, Gas and Mining to convert eleven existing producing wells to water injection wells in the Ratherford Unit secondary recovery project. The revised rule 502(b)(12) requires that you are notified of these plans and are provided with a copy of the application for injection well (Form DOGM-UIC-1). Under Rule 503 you are provided with the opportunity to object to the proposed application.

"Applications for Injection Well" are attached for the following existing wells:

	12W11	13W11	13W33
8W34	12W24	13W13	17W32
11W42	12W33	13W22	18W12

Please contact Renee Taylor or Blair Murphy at (307) 237-3791 with any questions.

Sincerely,

Original Signed By:

D. C. GILL

D. C. Gill
Area Manager

RCT/fb (17)

cc: B. J. Murphy-Casper
J. R. Reno-Cortez
St. of Utah OG&M/UIC
Casper-RC



PHILLIPS PETROLEUM COMPANY

CASPER, WYOMING 82602
BOX 2920 Box 2920, Casper, Wyoming 82602

EXPLORATION AND PRODUCTION GROUP

August 14, 1986

Texaco, Inc.
P.O. Box 3360
Casper, WY 82602
Attn: A. J. Sanford

Re: Ratherford Unit
Injection Well Conversions

Dear Sirs,

Phillips Petroleum Company has made application to the State of Utah, Division of Oil, Gas and Mining to convert eleven existing producing wells to water injection wells in the Ratherford Unit secondary recovery project. The revised rule 502(b)(12) requires that you are notified of these plans and are provided with a copy of the application for injection well (Form DOGM-UIC-1). Under Rule 503 you are provided with the opportunity to object to the proposed application.

"Applications for Injection Well" are attached for the following existing wells:

	12W11	13W11	13W33
8W34	12W24	13W13	17W32
11W42	12W33	13W22	18W12

Please contact Renee Taylor or Blair Murphy at (307) 237-3791 with any questions.

Sincerely,

Original Signed By:
D. C. GILL

D. C. Gill
Area Manager

RCT/fb (17)

cc: B. J. Murphy-Casper
J. R. Reno-Cortez
St. of Utah OG&M/UIC
Casper-RC

Publication was sent to the following:

Phillips Petroleum Company
Box 2920
Casper, Wyoming 82602

San Juan Record
PO Box 879
937 East Highway 666
Monticello, Utah 84535

Newspaper Agency
Legal Advertising
Mezzanine Floor
143 South Main
Salt Lake City, Utah 84110

Utah State Department of Health
Water Pollution Control
Attn: Loren Morton
4241 State Office Building
Salt Lake City, Utah 84114

U.S. Environmental Protection Agency
Suite 1300
Attn: Mike Strieby
999 18th Street
Denver, Colorado 80202-2413

Bureau of Land Management
Consolidated Financial Center
324 South State Street
Salt Lake City, Utah 84111-2303

Bureau of Land Management
Fluid Minerals Caller Service #4104
Farmington, New Mexico 87499

Navajo Tribe
Department of Water Management
PO Box 308
Window Rock Arizona 86515
Attn: Masued Uz Zaman

Mobil Oil Corporation
PO Box 5444
Denver, Colorado 80217

Texaco, Inc.
PO Box 3360
Casper, Wyoming 82602
Attn: A.J. Sanford

Sept. 11, 1984
Marilynne Loulser



STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

101703
Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

October 9, 1986

Phillips Petroleum Company
P.O. Box 2920
Casper, Wyoming 82602

Gentlemen:

RE: Injection Well Approval - Cause No. UIC-087

Insofar as this Division is concerned, administrative approval is hereby granted to convert the following wells to Class II enhanced recovery water injection wells:

RATHERFORD UNIT - San Juan County, Utah

#11W42, Sec. 11, T41S, R23E	#13W22, Sec. 13, T41S, R23E
#12W11, Sec. 12, T41S, R23E	#13W33, Sec. 13, T41S, R23E
#12W24, Sec. 12, T41S, R23E	# 8W34, Sec. 8, T41S, R24E
#12W33, Sec. 12, T41S, R23E	#17W32, Sec. 17, T41S, R24E
#13W11, Sec. 13, T41S, R23E	#18W12, Sec. 18, T41S, R24E
#13W13, Sec. 13, T41S, R23S	

This approval is conditional upon full compliance with the UIC rules and regulations adopted by the Board of Oil, Gas and Mining, and construction and operation of the wells as outlined in the application submitted.

If you have any questions concerning this matter, please do not hesitate to call or write.

Best regards,

Dianne R. Nielson
Dianne R. Nielson
Director

mfp
7627U

Affidavit of Publication

RECEIVED
OCT 0 - 1986

STATE OF UTAH,

SS.

County of Salt Lake

DIVISION OF
OIL, GAS & MINING

CHRIS. ANDERSON

BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH
CAUSE NO. UIC-087
IN THE MATTER OF THE APPLICATION OF PHILLIPS PETRO-
LEUM COMPANY, FOR THE ADMINISTRATIVE APPROVAL
TO INJECT FLUID INTO WELLS TO BE CONVERTED TO EN-
HANCED RECOVERY INJECTION WELLS LOCATED IN SEC-
TIONS 11, 12, AND 13, TOWNSHIP 41 SOUTH, RANGE 23 EAST;
AND SECTIONS 8, 17 AND 18, TOWNSHIP 41 SOUTH, RANGE 24
EAST, S.L.M., SAN JUAN COUNTY, UTAH.
THE STATE OF UTAH TO ALL INTERESTED PARTIES IN
THE ABOVE ENTITLED MATTER.
Notice is hereby given that Phillips Petroleum Company,
Box 2920, Casper, Wyoming 82602, has requested administra-
tive approval from the Division to convert the following listed
wells to enhanced recovery water injection wells:
RATHERFORD UNIT - San Juan County, Utah
#11W42, Sec. 11, T41S, R23E #13W22, Sec. 13, T41S, R23E
#12W11, Sec. 12, T41S, R23E #13W33, Sec. 13, T41S, R23E
#12W24, Sec. 12, T41S, R23E #8W34, Sec. 8, T41S, R24E
#12W33, Sec. 12, T41S, R23E #17W32, Sec. 17, T41S, R24E
#13W11, Sec. 13, T41S, R23E #18W12, Sec. 18, T41S, R24E
#13W13, Sec. 13, T41S, R23E
The proposed operating data for the wells is as follows:
Injection Interval: Paradox Formation 5303'-5548'
Maximum Estimated Surface Pressure: 3000 psig
Maximum Estimated Water Injection Rate: 500 BWPD
Approval of this Application will be granted unless any ob-
jections are filed with the Division of Oil, Gas and Mining within
fifteen days after publication of this Notice. Objections should be
mailed to the Division of Oil, Gas and Mining, Attention: UIC
Program Manager, 335 West North Temple, 3 Triad Center,
Suite 350, Salt Lake City, Utah 84103-1203.
DATED this 8th day of September, 1986.
STATE OF UTAH
DIVISION OF OIL, GAS AND MINING
MARJORIE L. ANDERSON
Administrative Assistant
A-75

Being first duly sworn, deposes and says that he/she is
legal advertising clerk of THE SALT LAKE TRIBUNE,
a daily newspaper printed in the English language with
general circulation in Utah, and published in Salt Lake
City, Salt Lake County, in the State of Utah, and of the
DESERET NEWS, a daily newspaper printed in the
English language with general circulation in Utah, and
published in Salt Lake City, Salt Lake County, in the
State of Utah.

That the legal notice of which a copy is attached hereto

CAUSE #UIC-087

was published in said newspaper on

SEPT 18, 1986

Legal Advertising Clerk

Subscribed and sworn to before me this 30th day of

SEPTEMBER

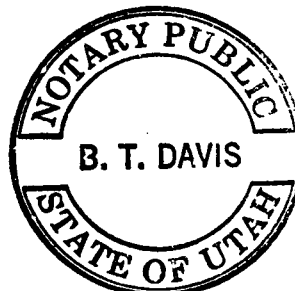
A.D. 1986

B. J. Davis

Notary Public

My Commission Expires

MARCH 01, 1988



Public Notice

THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

IN THE MATTER OF THE APPLICATION OF PHILLIPS PETROLEUM COMPANY, FOR ADMINISTRATIVE APPROVAL TO INJECT FLUID INTO WELLS TO BE CONVERTED TO ENHANCED RECOVERY INJECTION WELLS LOCATED IN SECTIONS 11, 12, AND 13, TOWNSHIP 41 SOUTH, RANGE 23 EAST; AND SECTIONS 8, 17 AND 18, TOWNSHIP 41 SOUTH, RANGE 24 EAST, S.L.M., SAN JUAN COUNTY, UTAH

CAUSE NO. UIC-087

THE STATE OF UTAH TO ALL INTERESTED PARTIES IN THE ABOVE ENTITLED MATTER.

Notice is hereby given that Phillips Petroleum Company, Box 2920, Casper, Wyoming 82602, has requested administrative approval from the Division to convert the following listed wells to enhanced recovery water injection wells:

RATHERFORD UNIT —
San Juan County, Utah
#11W42, Sec. 11, T41S, R23E
#12W11, Sec. 12, T41S, R23E
#12W24, Sec. 12, T41S, R23E
#12W33, Sec. 12, T41S, R23E
#13W11, Sec. 13, T41S, R23E
#13W13, Sec. 13, T41S, R23E
#13W22, Sec. 13, T41S, R23E
#13W33, Sec. 13, T41S, R23E
8W34, Sec. 8, T41S, R24E
#17W32, Sec. 17, T41S, R24E
#18W12, Sec. 18, T41S, R24E

The proposed operating data for the wells is as follows:

INJECTION INTERVAL: Paradox Formation 5303' - 5548'

MAXIMUM ESTIMATED SURFACE PRESSURE: 3000 psig.

MAXIMUM ESTIMATED WATER INJECTION RATE: 500 BWPD.

Approval of this Application will be granted unless any objections are filed with the Division of Oil, Gas and Mining within fifteen days after publication of this Notice. Objections should be mailed to the Division of Oil, Gas and Mining, Attention: UIC Program Manager, 355 West North Temple, 3 Triad Center, Suite 350, Salt Lake City, Utah 84160-1203.

DATED this 8th day of September, 1986.

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING
s/MARJORIE L. ANDERSON

Administrative Assistant

Published in The San Juan Record
September 24, 1986.

State of Utah, County of San Juan, ss. I, the undersigned, being a resident of the County of San Juan, State of Utah, do hereby certify that the foregoing is a true and correct copy of the original as the same appears in the files of the Division of Oil, Gas and Mining, State of Utah.

Witness my hand and the seal of the State of Utah, at the City of Salt Lake City, this 24th day of September, 1986.

NO. UIC-087

a copy of which is hereunto attached, was published in the regular and entire issue of each number of said newspaper for a period of one issues, the first publication having been made on September 24, 1986. ~~and the~~ last publication having been made on _____.

Joyce A. Markov
Publisher

Subscribed and sworn to before me this 24th day of September,

A.D. 1986

Ingrid K. Adams
Notary Public residing at Monticello, Utah

My commission expires December 2, 1987

BUREAU OF LAND MANAGEMENT

SUNDRY NOTICE AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/> 2. NAME OF OPERATOR Phillips Petroleum Company 3. ADDRESS OF OPERATOR P. O. Box 2920, Casper, WY 82602 4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface 1980' FNL, 560' FWL (SW NW)		5. LEASE DESIGNATION AND SERIAL NO. 14-20-603-353 6. IF OTHER, ALLOTTED OR OTHER NAME Navajo 122425 7. OTHER ALLOTTMENT NAME SW-I-4192 8. NAME OF LEASE NAME Ratherford Unit 9. WELL NO. 18-12 10. FIELD AND POOL, OR WILDCAT Greater Aneth 11. SEC., T., R., E., OR NE. AND CORNER OR AREA Sec. 18-T41S-R24E 12. COUNTY OR PARISH San Juan 13. STATE Utah
14. PERMIT NO. 43-037-31153	15. ELEVATIONS (Show whether W., H., or, etc.) 4687' RKB	

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO: <table style="width:100%;"> <tr> <td style="width:50%;"> TEST WATER SHUT-OFF <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> SHOOT OR ACIDIZE <input checked="" type="checkbox"/> REPAIR WELL <input type="checkbox"/> (Other) <u>Convert to Water Injection</u> </td> <td style="width:50%;"> PLUG OR ALTER CASING <input type="checkbox"/> MULTIPLE COMPLETE <input type="checkbox"/> ABANDON* <input type="checkbox"/> CHANGE PLANS <input type="checkbox"/> (Other) <input checked="" type="checkbox"/> </td> </tr> </table>	TEST WATER SHUT-OFF <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> SHOOT OR ACIDIZE <input checked="" type="checkbox"/> REPAIR WELL <input type="checkbox"/> (Other) <u>Convert to Water Injection</u>	PLUG OR ALTER CASING <input type="checkbox"/> MULTIPLE COMPLETE <input type="checkbox"/> ABANDON* <input type="checkbox"/> CHANGE PLANS <input type="checkbox"/> (Other) <input checked="" type="checkbox"/>	SUBSEQUENT REPORT OF: <table style="width:100%;"> <tr> <td style="width:50%;"> WATER SHUT-OFF <input type="checkbox"/> FRACTURE TREATMENT <input type="checkbox"/> SHOOTING OR ACIDIZING <input type="checkbox"/> (Other) _____ </td> <td style="width:50%;"> REPAIRING WELL <input type="checkbox"/> ALTERING CASING <input type="checkbox"/> ABANDONMENT* <input type="checkbox"/> </td> </tr> </table>	WATER SHUT-OFF <input type="checkbox"/> FRACTURE TREATMENT <input type="checkbox"/> SHOOTING OR ACIDIZING <input type="checkbox"/> (Other) _____	REPAIRING WELL <input type="checkbox"/> ALTERING CASING <input type="checkbox"/> ABANDONMENT* <input type="checkbox"/>
TEST WATER SHUT-OFF <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> SHOOT OR ACIDIZE <input checked="" type="checkbox"/> REPAIR WELL <input type="checkbox"/> (Other) <u>Convert to Water Injection</u>	PLUG OR ALTER CASING <input type="checkbox"/> MULTIPLE COMPLETE <input type="checkbox"/> ABANDON* <input type="checkbox"/> CHANGE PLANS <input type="checkbox"/> (Other) <input checked="" type="checkbox"/>				
WATER SHUT-OFF <input type="checkbox"/> FRACTURE TREATMENT <input type="checkbox"/> SHOOTING OR ACIDIZING <input type="checkbox"/> (Other) _____	REPAIRING WELL <input type="checkbox"/> ALTERING CASING <input type="checkbox"/> ABANDONMENT* <input type="checkbox"/>				

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

It is proposed to convert Ratherford Unit #18-12 from a Zone I producer to a Zone I injection well. Upon conversion, the well will be acidized with approximately 3000 gallons of 28% HCl Acid and placed on injection.

A 10' x 8' x 6' fenced pit will be constructed on location in a previously disturbed area. Upon completion of the workover the pit will be dried and recovered.

5-BLM, Farmington, NM
 2-Utah O&G CC, Salt Lake City
 1-P. J. Adamson
 1-M. Williams, 302 TRW
 1-J. R. Reno
 1-B. J. Murphy
 1-File RC

APPROVED BY THE STATE OF UTAH DIVISION OF OIL, GAS, AND MINING
DATE: 12/1/86
BY: [Signature]
Approval letter 10/9/86

RECEIVED
 NOV 21 1986
 DIVISION OF OIL, GAS & MINING

18. I hereby certify that the foregoing is true and correct

SIGNED <u>[Signature]</u> D. C. GILL <small>(This space for Federal or State office use)</small>	TITLE <u>Area Manager</u>	DATE <u>November 17, 1986</u>
---	----------------------------------	--------------------------------------

APPROVED BY _____ **TITLE** _____ **DATE** _____

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

MONTHLY REPORT OF ENHANCED RECOVERY PROJECT - PART 2 Page 3

MONTHLY MONITORING OF INJECTION WELLS

<u>Well Name</u>	<u>Int. Press.</u>	<u>Int. Rate</u>	<u>Annulus Press.</u>	<u>Monthly Int. Vol.</u>
15W2343-037-16412 ✓	1950	49		1372
15W4343-037-16413 ✓ 43-037-15720	1800	20		562
16W12 New 2/19/87 43-037-15721	1350	380		3864
16W14 New 2/26/87	2225	110		329
16W21-43-037-16414 ✓	1250	322		9027
16W23 43-037-15722 ✓	1200	178		4971
16W4343-037-16415 ✓	2200	114		3202
17W1243-037-15723 ✓	2250	82		2303
17W2143-037-16411 ✓	2300	42		1187
17W2343-037-15724 ✓	2400	62		1733
17W4143-037-15731 ✓	2275	60		1693
17W4343-037-16417 ✓ 43-037-31153	2375	23		647
18W12 New 2/13/87	1900	252		4025
18W1443-037-15735 ✓	2200	14		392
18W21 43-037-16418 ✓	2200	36		1019
18W2343-037-30044 ✓	2100	92		2586
18W3243-037-15736 ✓ 43-037-15737	2300	54		1517
18W34 New 2/11/87	0	462		8310
18W41 43-037-15738 ✓	2200	41		1155
18W43 43-037-16419 ✓	SI	SI		SI
19W21 -43-037-15741 ✓	2300	144		4040
19W23 43-037-15742 ✓	2300	166		41638

MONTHLY REPORT OF ENHANCED RECOVERY PROJECT - PART 2 Page 3

MONTHLY MONITORING OF INJECTION WELLS

<u>Well Name</u>	<u>Ini. Press.</u>	<u>Ini. Rate</u>	<u>Annulus Press.</u>	<u>Monthly Ini. Vol.</u>
15W2343-037-16412 ✓	1950	49		1372
15W4343-037-16413 ✓	1800	20		562
43-037-15720				
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43-037-15721				
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16W21-43-037-16414 ✓	1250	322		9027
16W23 43-037-15722 ✓	1200	178		4971
16W4343-037-16415 ✓	2200	114		3202
17W1243-037-15726 ✓	2250	82		2303
17W2143-037-16416 ✓	2300	42		1187
17W2343-037-15727 ✓	2400	62		1733
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17W4343-037-16417 ✓	2375	23		647
43-037-31153				
18W12 New 2/13/87	1900	252		4025
18W1443-037-15735 ✓	2200	14		392
18W2143-037-16418 ✓	2200	36		1019
18W2343-037-15736 ✓	2100	92		2586
18W3243-037-15737 ✓	2300	54		1517
43-037-15737				
18W34 New 2/11/87	0	462		8310
18W4143-037-15738 ✓	2200	41		1155
18W43 43-037-16419 ✓	SI	SI		SI
19W21 -43-037-15741 ✓	2300	144		4040
19W23 43-037-15742 ✓	2300	166		4638

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Budget Bureau No. 1004-0135
Expires August 31, 1985

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. <input type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <u>Water Injector</u>		7. UNIT ASSIGNMENT NAME <u>SW-I-4192</u>	
2. NAME OF OPERATOR <u>Phillips Petroleum Company</u>		8. FARM OR LEASE NAME <u>Ratherford Unit</u>	
3. ADDRESS OF OPERATOR <u>P.O. Box 2920, Casper, WY 82602</u>		9. WELL NO. <u>18W12</u>	
4. LOCATION OF WELL (Report location clearly and in accordance with any well measurements.* See also space 17 below.) <u>At surface</u> <u>1980' FNL, 560' FWL SW NW</u>		10. FIELD AND POOL, OR WILDCAT <u>Greater Aneth</u>	
5. PERMIT NO. <u>API# 43-037-31153</u>		11. SEC., T., R., N., OR S.E. AND SUBST. OR AREA <u>Sec. 18-T41S-R24E</u>	
16. ELEVATIONS (Show whether SP, ST, OR, etc.) <u>4687' RKB</u>		12. COUNTY OR PARISH <u>San Juan</u>	
		13. STATE <u>Utah</u>	

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF
FRACTURE TREAT
SHOOT OR ACIDIZE
REPAIR WELL
(Other)

PULL OR ALTER CASING
MULTIPLE COMPLETION
ABANDON*
CHANGE PLANS

SUBSEQUENT REPORT OF:

WATER SHUT-OFF
FRACTURE TREATMENT
SHOOTING OR ACIDIZING
(Other) Convert to water injection

REPAIRING WELL
ALTERING CASING
ABANDONMENT*

XX

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Feb. 2, 1987 through Feb. 12, 1987

RU 2/2/87. COOH w/rods and tbq. Clean out hole to 5517'. Acidized Zone I w/3000 gal 28% HCL acid. Swbd back load. GIH w/Duoline 2-7/8" tbq and wtr inj pkr. Set pkr at 5382'. RD and HU to injection 2/13/87.

Production Before 11 BOPD 0 BOPD
Injection After 252 BOPD @ 1900 psi

4-BLM, Farmington, NM 1-Chieftain
2-Utah O&G CC, SLC, UT 1-Mobil Oil
1-M. Williams, B'Ville 1-Texaco, Inc.
1-J. Landrum, Denver 1-Chevron USA
1-J. Reno, Cortez 1-File RC

18. I hereby certify that the foregoing is true and correct

SIGNED

D. C. GILL

TITLE Area Manager

DATE

7/27/87

(This space for Federal or State office use)

APPROVED BY

TITLE

DATE

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

DOWNHOLE SCHEMATIC

Date: 8/6/87

RATHERFORD Unit # 18W12

Location SW NW sec. 18
T41S-R24E

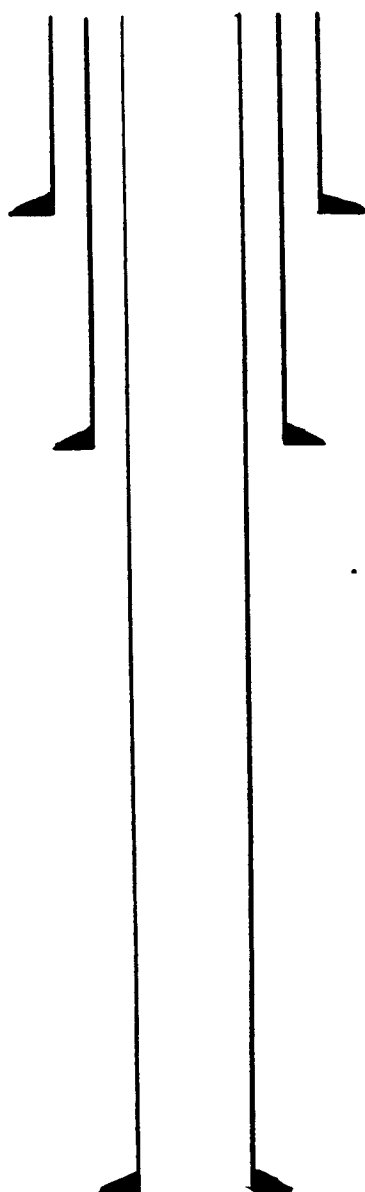
RKB Elev. 4687'

Well Drd 7/29/85

GL Elev. 4675'

Well converted
to injector 2/12/87

RKB Above GL' 12'



CONDUCTOR Csg. 13³/₈ @ 122'

SURFACE Csg. 9⁵/₈ @ 1537'

TOC 3170' calc.

Tubing 2⁷/₈ @ 5382'

PACKER Otis Inter-lock PKR
Nickel COATED @ 5382'

PERFS	<u>5478 - 5491</u>	<u> </u>	<u> </u>
	<u> </u>	<u> </u>	<u> </u>
	<u> </u>	<u> </u>	<u> </u>
	<u> </u>	<u> </u>	<u> </u>

PBTD 5517'

PRODUCTION Csg. 7' @ 5542
K-55, S-95, 23#, 26#

All PERFS Zone I unless noted

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPL
(Other instructions
verse side)

re

Form approved.
Budget Bureau No. 1004-0135
Expires August 31, 1985

5

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL ☐ GAS WELL ☐ OTHER ☒ Water Injection Well

2. NAME OF OPERATOR

Phillips Petroleum Company

3. ADDRESS OF OPERATOR

P. O. Box 1150, Cortez, CO 81321

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.
See also space 17 below.)
At surface

1980' FNL & 560' FWL

14. PERMIT NO.

45-037-31153

15. ELEVATIONS (Show whether DF, RT, GR, etc.)

4687' RKB

5. LEASE DESIGNATION AND SERIAL NO

14-20-603-353

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

Navajo

UNIT AGREEMENT NAME

SW-I-4192

FARM OR LEASE NAME

Ratherford Unit

9. WELL NO.

#18W12

10. FIELD AND POOL, OR WILDCAT

Greater Aneth

11. SEC., T., S., M., OR BLK. AND
SURVEY OR AREA

Sec. 18-T41S-R24E

12. COUNTY OR PARISH

San Juan

13. STATE

Utah

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF

FRACTURE TREAT

SHOOT OR ACIDIZE

REPAIR WELL

(Other)

PULL OR ALTER CASING

MULTIPLE COMPLETE

ABANDON*

CHANGE PLANS

SUBSEQUENT REPORT OF:

WATER SHUT-OFF

FRACTURE TREATMENT

SHOOTING OR ACIDIZING ☒

(Other)

REPAIRING WELL

ALTERING CASING

ABANDONMENT*

(NOTE: Report results of multiple completion on Well
Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)

November 11, 1987 through November 23, 1987

Move in & Rig up Well Service Unit on 11/11/87. POOH with injection packer and tubing. RIH with packer on tubing workstring, set packer @ 5390'. Acidized with 2500 gal 28% HCl acid. Swab back load. RIH with injection equipment. Pressure tubing/casing annulus to 1000 psi, held for 20 minutes. RR and place well back on water injection 11/23/87.

Injection Before: 157 BWIPD @ 2500 psi
Injection After: 235 BWIPD @ 2275 psi

4-BLM
2-Utah O & G
1-M. Williams, Bartlesville
1-R. J. Rundt (r) Engineering
1-D. C. Gill (r) Denver Files
1-Texaco, U.S.A., Casper, WY
1- Cortez Office - RC

18. I hereby certify that the foregoing is true and correct

SIGNED

TITLE District Superintendent

DATE

6/6/88

(This space for Federal or State office use)

APPROVED BY

TITLE

DATE

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE*
(Other instructions on re-
verse side)

Budget Bureau No. 1004-0135
Expires August 31, 1985

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. <input type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER WATER INJECTION & WATER SUPPLY WELLS		5. LEASE DESIGNATION AND SERIAL NO.
2. NAME OF OPERATOR PHILLIPS PETROLEUM COMPANY		6. IF INDIAN, ALLOTTEE OR TRIBE NAME SW-I-4192
3. ADDRESS OF OPERATOR 152 N. DURBIN, 2ND FLOOR, CASPER, WYOMING-82601		7. UNIT AGREEMENT NAME RATHERFORD UNIT #7960041920
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface <u>SEE ATTACHED</u>		8. FARM OR LEASE NAME
14. PERMIT NO.		9. WELL NO. VARIOUS (see attached)
15. ELEVATIONS (Show whether DF, RT, GR, etc.) OIL, GAS & MINING		10. FIELD AND POOL, OR WILDCAT GREATER ANETH
		11. SEC., T., R., N., OR BLK. AND SURVEY OR AREA Sections 1 thru 30 T41S - R23E & 24E
		12. COUNTY OR PARISH San Juan
		13. STATE Utah

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	FULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANE <input type="checkbox"/>	(Other) <u>CHANGE OF OWNERSHIP</u> <input checked="" type="checkbox"/>	
(Other) <input type="checkbox"/>		(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

This is to advise all Water Injection and Water Supply Wells on the Ratherford Unit, listed on the attached sheet, were sold to Phillips Petroleum Company, effective August 1, 1985.

(former Operator - Phillips Oil Company)

3 - BLM, Farmington, NM
2 - Utah O&G CC, SLC, UT
1 - File

18. I hereby certify that the foregoing is true and correct

SIGNED <u>S. H. Oden</u>	TITLE <u>District Superintendent</u>	DATE <u>March 17, 1989</u>
(This space for Federal or State office use)		
APPROVED BY _____	TITLE _____	DATE _____
CONDITIONS OF APPROVAL, IF ANY:		

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED

JUL 05 1991

FORM APPROVED
Budget Bureau No. 1004-1135
Expires September 30, 1992

DIVISION OF
OIL GAS & MINING

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals

SUBMIT IN TRIPLICATE

1. Type of Well
☐ Oil Well ☐ Gas Well ☒ Other Water Injection

2. Name of Operator
PHILLIPS PETROLEUM COMPANY,

3. Address and Telephone No. 505-599-3455
5525 Hwy 64, NBU 3004, Farmington, NM 87401

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

SEE BELOW

5. Lease Designation and Serial No.
See Below

6. If Indian, Allottee or Tribe Name
Navajo Tribal

7. If Unit or CA Agreement Designation
Ratherford
SW-I-4192

8. Well Name and No
See Below

9. API Well No.
43-027-31153

10. Field and Pool, or Exploratory Area
Greater Aneth

11. County or Parish, State
San Juan, Utah

12. CHECK APPROPRIATE BOX(S) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION
<input type="checkbox"/> Notice of Intent	<input type="checkbox"/> Abandonment
<input checked="" type="checkbox"/> Subsequent Report	<input type="checkbox"/> Recompletion
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Plugging Back
	<input type="checkbox"/> Casing Repair
	<input type="checkbox"/> Altering Casing
	<input checked="" type="checkbox"/> Other
	MIT Compliance
	(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)

During the MIT test being performed by the EPA. (Mr. George Robin) from 6/18/91-6/27/91 four wells were found to have tubing hanger leaks. The four wells and their locations are listed below. Within 180 days these wells will have the tubing hanger seals repaired/replaced. A MIT will be performed at that time to ensure mechanical integrity.

10W23, 1980 FSL, 1980 FWL, Sec. 10, T41S, R24E, Lease # 14-20-603-4043
19W43, 1980 FSL, 760 FEL, Sec. 19, T41S, R24E, Lease # 14-20-603-353
17W12, 1980 FNL, 760 FEL, Sec. 17, T41S, R24E, Lease # 14-20-603-353
18W12, 1980 FNL, 560 FWL, Sec. 18, T41S, R24E, Lease # 14-20-603-353

Distribution:

BLM-Farmington

Utah O&G, CC

EPA, San Francisco

Navajo EPA, Window Rock

Chieftain

Mobil

Texaco

Robert G. Flesher

W.R. Heuman

V.S. Shaw -Houston

N.D. Anstine -Bartlesv.

PPCo-Houston

14. I hereby certify that the foregoing is true and correct

Signed

(This space for Federal or State office use)

Title

Sr. Drilling & Prod. Eng. Date 7-1-91

Approved by

Conditions of approval, if any:

Title

Date

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

*See Instruction on Reverse Side

MONTHLY OIL AND GAS PRODUCTION REPORT

OPERATOR NAME AND ADDRESS:

ACCOUNT NUMBER: N0772

P J KONKEL
PHILLIPS PETROLEUM COMPANY
5525 HWY 64 NBU 3004
FARMINGTON NM 87401

AUG 16 1993

REPORT PERIOD (MONTH/YEAR):

6 / 93

DIVISION OF
OIL, GAS & MININGAMENDED REPORT ☐ (Highlight Changes)

Well Name					Producing Zone	Well Status	Days Oper	Production Volumes		
API Number	Entity	Location						OIL(BBL)	GAS(MCF)	WATER(BBL)
#21-23										
4303713754	06280	41S	24E	21	DSCR	POW	29	1374	883	58
#3-44										
4303715031	06280	41S	24E	3	DSCR	POW	30	111	94	2905
#3-14										
4303715124	06280	41S	24E	3	DSCR	POW	30	67	23	302
#9-12										
4303715126	06280	41S	24E	9	DSCR	POW	30	112	654	17363
#9-14										
4303715127	06280	41S	24E	9	DSCR	POW	30	201	315	423
#28-12										
4303715336	06280	41S	24E	28	PRDX	POW	29	112	47	2428
#29-12										
4303715337	06280	41S	24E	29	PRDX	POW	29	56	0	672
#29-32										
4303715339	06280	41S	24E	29	DSCR	POW	29	1402	287	2224
#29-34										
4303715340	06280	41S	24E	29	DSCR	POW	29	757	48	0
#30-32										
4303715342	06280	41S	24E	30	DSCR	POW	29	588	1049	3744
#3-12										
4303715620	06280	41S	24E	3	DSCR	POW	30	268	11	363
#9-34										
4303715711	06280	41S	24E	9	DSCR	POW	30	45	46	9800
#10-12										
4303715712	06280	41S	24E	10	DSCR	POW	30	45	23	1088
TOTALS								5138	3480	41370

COMMENTS: Effective July 1, 1993, Phillips Petroleum Company has sold its interest in the Ratherford Unit to Mobil Exploration and Producing U.S., Incorporated, P. O. Box 633, Midland, Texas 79702. Mobil assumed operations on July 1, 1993.

I hereby certify that this report is true and complete to the best of my knowledge.

Date: 8/11/93

Name and Signature: PAT KONKEL

Pat Konkell

Telephone Number: 505 599-3452

STATE OF UTAH
DIVISION OF OIL, GAS AND MININGPage 1 of 1

MONTHLY OIL AND GAS DISPOSITION REPORT

OPERATOR NAME AND ADDRESS:

BRIAN BERRY

M E P N A MOBIL

POB 219031 1807A RENTWY P.O. DRAWER G

DALLAS TX 75221-9031 CORTEZ, CO. 81321

UTAH ACCOUNT NUMBER: N7370REPORT PERIOD (MONTH/YEAR): 7 / 93AMENDED REPORT ☐ (Highlight Changes)X931006 updated.
Joe

ENTITY NUMBER	PRODUCT	GRAVITY	BEGINNING INVENTORY	VOLUME PRODUCED	DISPOSITIONS				ENDING INVENTORY
		BTU			TRANSPORTED	USED ON SITE	FLARED/VENTED	OTHER	
05980	OIL			177609	177609	0			
	GAS			72101	66216	5885			
11174	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
TOTALS				249710	243825	5885			

COMMENTS:

PLEASE NOTE ADDRESS change. Mobil ~~ASU~~ PRODUCTION REPORTS
will be compiled and sent from the Cortez, Co. office
IN THE FUTURE.

I hereby certify that this report is true and complete to the best of my knowledge.

Name and Signature:

Lewell B Sheffield

Date:

9/5/93

Telephone Number:

303.565.2212
244.658.2528

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

SUNDRY NOTICES AND REPORTS ON WELLS (Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)		3. LEASE DESIGNATION & SERIAL NO.
1. OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/>		6. IF INDIAN, ALLOTTEE OR TRIBE NAME NAVAJO TRIBAL
2. NAME OF OPERATOR MOBIL OIL CORPORATION		7. UNIT AGREEMENT NAME RATHERFORD UNIT
3. ADDRESS OF OPERATOR P. O. BOX 633 MIDLAND, TX 79702		8. FARM OR LEASE NAME
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements. See also space 17 below.) At surface		9. WELL NO.
10. FIELD AND POOL, OR WILDCAT GREATER ANETH		11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
14. API NO.	15. ELEVATIONS (Show whether DF, RT, GR, etc.)	12. COUNTY SAN JUAN
		13. STATE UTAH

16. Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) <u>CHANGE OF OPERATOR</u> <input type="checkbox"/>	
(Other) <input type="checkbox"/>		(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	
APPROX. DATE WORK WILL START _____		DATE OF COMPLETION _____	

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)

* Must be accompanied by a cement verification report.

AS OF JULY1, 1993, MOBIL OIL CORPORATION IS THE OPERATOR OF THE RATHERFORD UNIT.
ATTACHED ARE THE INDIVIDUAL WELLS.

18. I hereby certify that the foregoing is true and correct

SIGNED Shirley Todd TITLE ENV. & REG TECHNICIAN DATE 9-8-93

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

See Instructions On Reverse Side

✓ 12W-44	43-037-16405	14-20-603-246A	SEC. 12, T41S, R23E	SE/SE 660 FSL; 660 FEL	PA'd
✓ 12W-44A	43-037-31543	14-20-603-246A	SEC. 12, T41S, R23E	SE/SE 807 FEL; 772 FSL	
✓ 13-11W	43-037-31152	14-20-603-247A	SEC. 13, T41S, R23E	NW/NW 500 FNL; 660 FWL	
✓ 13-12	43-037-31127	14-20-603-247A	SEC. 13, T41S, R23E	SW/NW 1705 FNL; 640 FWL	
✓ 13W-13	43-037-15851	14-20-603-247A	SEC. 13, T41S, R23E	NW/SW 1980 FSL; 4620 FEL	
✓ 13-14	43-037-31589	14-20-603-247A	SEC. 13, T41S, R23E	660 FSL; 660 FWL	
✓ 13-21	43-037-31128	14-20-603-247A	SEC. 13, T41S, R23E	NE/NW 660 FNL; 1920 FWL	
✓ 13W-22	43-037-15852	14-20-603-247A	SEC. 13, T41S, R23E	SE/NW 1988 FNL; 3300 FEL	
✓ 13-23	43-037-31129	14-20-603-247A	SEC. 13, T41S, R23E	NE/SW 1980 FSL; 1930 FWL	
✓ 13W-44	43-037-15853	14-20-603-247	SEC. 13, T41S, R23E	600 FSL; 3300 FEL	
✓ 13W-32	43-037-16406	14-20-603-247A	SEC. 13, T41S, R23E	1881 FNL; 1979 FEL	
✓ 13W-33	43-037-15855	14-20-603-247A	SEC. 13, T41S, R23E	NW/SE 1970 FSL; 1979 FEL	
✓ 13W-34	43-037-31130	14-20-603-247A	SEC. 13, T41S, R23E	SW/SE 660 FSL; 1980 FEL	
✓ 13-41	43-037-15856	14-20-603-247A	SEC. 13, T41S, R23E	NE/NE 660 FNL; 660 FEL	
✓ 13W-42	43-037-15857	14-20-603-247A	SEC. 13, T41S, R23E	SE/NE 2139; 585 FEL	
✓ 13-43	43-037-31131	14-20-603-247A	SEC. 13, T41S, R23E	NE/SE 1700 FSL; 960 FEL	
✓ 13W-44	43-037-16407	14-20-603-247A	SEC. 13, T41S, R23E	SE/SE 635 FSL; 659 FEL	
✓ 14-03	NA	14-20-603-4037	SEC. 11, T41S, R23E	SW/SW 660 FSL; 660 FEL	
✓ 14-32	43-037-15858	14-20-603-247A	SEC. 14, T41S, R23E	2130 FNL; 1830 FEL	
✓ 14-41	43-037-31623	14-20-603-247A	SEC. 14, T41S, R23E	NE/NE 521 FEL; 810 FNL	
✓ 14W-42	43-037-15860	14-20-603-247A	SEC. 14, T41S, R23E	SE/NE 1976 FNL; 653 FEL	
✓ 14W-43	43-037-16410	14-20-603-247A	SEC. 14, T41S, R23E	3300 FSL; 4770 FEL	
✓ 14-33	43-037-15859	14-20-603-247	SEC. 14, T41S, R23E	2130 FSL; 1830 FEL	
✓ 15-12	43-037-15715	14-20-603-355	SEC. 15, T41S, R24E	1820 FNL; 500 FWL	
✓ 15W-21	43-037-16411	14-20-603-355	SEC. 15, T41S, R24E	660 FNL; 1820 FWL	
✓ 15-22	43-037-30449	14-20-603-355	SEC. 15, T41S, R24E	SE/NW, 1980 FNL; 2050 FWL	
✓ 15-32	43-037-15717	14-20-603-355A	SEC. 15, T41S, R24E	1980 FNL; 1980 FEL	
✓ 15-33	43-037-15718	14-20-603-355	SEC. 15, T41S, R24E	NW/SE 1650 FSL; 1980 FEL	
✓ 15-41	43-037-15719	14-20-603-355	SEC. 15, T41S, R24E	660 FNL; 660' FEL	
✓ 15-42	43-037-30448	14-20-603-355	SEC. 15, T41S, R24E	SE/NE 2020 FNL; 820 FEL	
✓ 16W-12	43-037-15720	14-20-603-355	SEC. 16, T41S, R24E	SW/NW 1880 FNL; 660 FWL	
✓ 16-13	43-037-31168	14-20-603-355	SEC. 16, T41S, R24E	1980 FSL; 660 FWL	
✓ 16W-14	43-037-15721	14-20-603-355	SEC. 16, T41S, R24E	SW/SW 660 FSL; 660 FWL	
✓ 16W-21	43-037-16414	14-20-603-355	SEC. 16, T41S, R24E	NE/NW 660 FNL; 1880 FWL	
✓ 16W-23	43-037-15722	14-20-603-355	SEC. 16, T41S, R24E	NE/SW 1980 FSL; 1980 FWL	
✓ 16-32	43-037-15723	14-20-603-355	SEC. 16, T41S, R24E	1980 FNL; 1980' FEL	
✓ 16-34	43-037-15724	14-20-603-355	SEC. 16, T41S, R24E	660 FNL; 1980' FEL	
✓ 16-41	43-037-15725	14-20-603-355	SEC. 16, T41S, R24E	660 FNL; 660 FEL	
✓ 16W-43	43-037-16415	14-20-603-355	SEC. 16, T41S, R24E	NE/SE 2140 FSL; 820 FEL	
✓ 17-11	43-037-31169	14-20-603-353	SEC. 17, T41S, R24E	NW/NW 1075' FNL; 800' FWL	
✓ 17W-12	43-037-15726	14-20-603-353	SEC. 17, T41S, R24E	SW/NW 1980' FNL; 510' FWL	
✓ 17-13	43-037-31133	14-20-603-353	SEC. 17, T41S, R24E	NW/SW 2100' FSL; 660' FWL	
✓ 17W-14	43-037-15727	14-20-603-353	SEC. 17, T41S, R24E	SW/SW 660' FSL; 660' FWL	
✓ 17W-21	43-037-16416	14-20-603-353	SEC. 17, T41S, R24E	510' FNL; 1830' FWL	
✓ 17-22	43-037-31170	14-20-603-353	SEC. 17, T41S, R24E	1980' FNL; 1980' FWL	
✓ 17W-23	43-037-15728	14-20-603-353	SEC. 17, T41S, R24E	NE/SW 1980' FWL; 1880' FSL	
✓ 17-31	43-037-31178	14-20-603-353	SEC. 17, T41S, R24E	NW/NE 500' FNL; 1980' FEL	
✓ 17-32W	43-037-15729	14-20-603-353	SEC. 17, T41S, R24E	SW/NE 1830' FNL; 2030' FEL	
✓ 17-33	43-037-31134	14-20-603-353	SEC. 17, T41S, R24E	NW/SE 1980' FSL; 1845' FEL	
✓ 17-34W	43-037-15730	14-20-603-353	SEC. 17, T41S, R24E	SW/SE 560' FSL; 1880' FEL	
✓ 17W-41	43-037-15731	14-20-603-353	SEC. 17, T41S, R24E	610' FNL; 510' FEL	
✓ 17-42	43-037-31177	14-20-603-353	SEC. 17, T41S, R24E	SE/NE 1980; FNL, 660' FEL	
✓ 17-44	43-037-15732	14-20-603-353	SEC. 17, T41S, R24E	660 FSL; 660' FEL	
✓ 17W-43	43-037-16417	14-20-603-353	SEC. 17, T41S, R24E	NE/SE 1980' FSL; 660' FEL	
✓ 18-11	43-037-15733	14-20-603-353	SEC. 18, T41S, R24E	NW/NW 720' FNL; 730' FWL	
* 18-12W	43-037-31153	14-20-603-353	SEC. 18, T41S, R24E	SW/NW 1980' FNL; 560' FWL	
✓ 18W-21	43-037-16418	14-20-603-353	SEC. 18, T41S, R24E	NE/NW 660' FNL; 1882' FWL	
✓ 18-22	43-037-31236	14-20-603-353	SEC. 18, T41S, R24E	SW/NW 2200' FNL; 2210' FWL	
✓ 18W-23	43-037-30244	14-20-603-353	SEC. 18, T41S, R24E	NE/SW 2385' FSL; 2040' FWL	
✓ 18W-14	43-037-15735	14-20-603-353	SEC. 18, T41S, R24E	SW/SW 810' FSL; 600' FWL	
✓ 18-24	43-037-31079	14-20-603-353	SEC. 18, T41S, R24E	SE/SW 760' FSL; 1980' FWL	
✓ 18-31	43-037-31181	14-20-603-353	SEC. 18, T41S, R24E	NW/NE 795' FNL; 2090; FEL	
✓ 18W-32	43-037-15736	14-20-603-353	SEC. 18, T41S, R24E	SW/NE 2140' FNL; 1830' FEL	
✓ 18-33	43-037-31135	14-20-603-353	SEC. 18, T41S, R24E	NW/SE 1870' FSL; 1980' FEL	
✓ 18-34W	43-037-15737	14-20-603-353	SEC. 18, T41S, R24E	SW/SE 780' FSL; 1860 FEL	
✓ 18W-41	43-037-15738	14-20-603-353	SEC. 18, T41S, R24E	NE/NE 660' FNL; 660' FEL	
✓ 18-42	43-037-31182	14-20-603-353	SEC. 18, T41S, R24E	SE/NE 2120' FNL; 745' FEL	
✓ 18W-43	43-037-16419	14-20-603-353	SEC. 18, T41S, R24E	NE/SE 1980' FSL; 660' FEL	PA'd
✓ 18-44	43-037-31045	14-20-603-353	SEC. 18, T41S, R24E	SE/SE 660' FSL; 660' FEL	
✓ 19-11	43-037-31080	14-20-603-353	SEC. 19, T41S, R24E	NW/NW 660' FNL; 660' FWL	
✓ 19-12	43-037-15739	14-20-603-353	SEC. 19, T41S, R24E	600' FWL; 1980' FNL	
✓ 19-14	43-037-15740	14-20-603-353	SEC. 19, T41S, R24E	600' FSL; 660' FEL	

Sept 29, 1993

TO: Lisha Cordova - Utah Mining
Oil & Gas

FROM: Janice Easley
BLM Farmington, NM
505 599-6355

Here is copy of Rutherford Unit
Successor Operator,

4 pages including this one.

2.6. Ratherford Unit (GC)

RECEIVED
BLM

JUL 27 AM 11:44

070 FARMINGTON, NM

Navajo Area Office
P. O. Box 1060
Gallup, New Mexico 87305-1060

ARES/543

JUL 26 1993

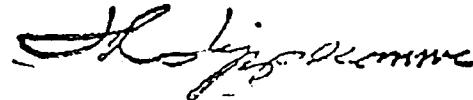
Mr. G. D. Cox
Mobil Exploration and
Producing North America, Inc.
P. O. Box 633
Midland, Texas 79702

Dear Mr. Cox:

Enclosed for your information and use is the approved Designation of Operator between the Phillips Petroleum Company and Mobil Exploration and Producing North America, Inc. for the Ratherford Unit.

Please note that all other concerned parties will be furnished their copy of the approved document.

Sincerely,



ACTING Area Director

Enclosure

cc: Bureau of Land Management, Farmington District Office w/enc.
TNN, Director, Minerals Department w/enc.

MINERALS	1993
NO.	1592
DATE	
BY	
3	
2	
ALL COPY	
FILE	

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS

DESIGNATION OF OPERATOR

RECEIVED
BLM

Phillips Petroleum Company is, on the records of the Bureau of Indian Affairs, operator of the Ratherford Unit,

AREA OFFICE: Window Rock, Arizona
LEASE NO: Attached hereto as Exhibit "A"

JUN 27 11:44
070 FARMINGTON, NM

and, pursuant to the terms of the Ratherford Unit Agreement, is resigning as Unit Operator effective July 1, 1993, and hereby designates

NAME: Mobil Exploration and Producing North America Inc., duly elected pursuant to the terms of the Ratherford Unit Agreement,

ADDRESS: P. O. Box 633, Midland, Texas 79702
Attn: G. D. Cox

as Operator and local agent, with full authority to act on behalf of the Ratherford Unit lessees in complying with the terms of all leases and regulations applicable thereto and on whom the authorized officer may serve written or oral instructions in securing compliance with the Operating Regulations (43 CFR 3160 and 25 CFR 211 and 212) with respect to (described acreage to which this designation is applicable):

Attached hereto as Exhibit "A"

Bond coverage under 25 CFR 211, 212 or 225 for lease activities conducted by the above named designated operator is under Bond Number 05202782 (attach copy). Evidence of bonding is required prior to the commencement of operations.

It is understood that this designation of operator does not relieve any lessee of responsibility for compliance with the terms of the leases and the Operating Regulations. It is also understood that this designation of operator does not constitute an assignment of any interest in the leases.

In case of default on the part of the designated operator, the lessees will make full and prompt compliance with all regulations, lease terms, stipulations, or orders of the Secretary of the Interior or his representative.

Attached is the appropriate documentation relevant to this document.

The designated operator agrees to promptly notify the authorized officer of any change in the operatorship of said Ratherford Unit.

Phillips Petroleum Company

June 17, 1993

By: M. B. [Signature]
Attorney-in-Fact

Mobil Exploration and Producing
North America Inc.

June 11, 1993

By: B. D. Martiny
Attorney-in-Fact B.D. MARTINY

[Signature] ACTING AREA DIRECTOR
APPROVED BY TITLE DATE
7/9/93

APPROVED PURSUANT, TO SECRETARIAL REDELEGATION ORDER 209 DM 8 AND 230 DM 3.

This form does not constitute an information collection as defined by 44 U.S.C. 3502 and therefore does not require OMB approval.

EXHIBIT "A"

ATTACHED TO AND MADE A PART OF DESIGNATION OF SUCCESSOR OPERATOR, RATHERFORD UNIT

EXHIBIT "C"

Revised as of September 29, 1992
SCHEDULE OF TRACT PERCENTAGE PARTICIPATION

<u>Tract Number</u>	<u>Description of Land</u>	<u>Serial Number and Effective Date of Lease</u>	<u>Tract Percentage Participation</u>
1	S/2 Sec. 1, E/2 SE/4 Sec. 2, E/4 Sec. 11, and all of Sec. 12, T-41-S, R-23-E, S.L.M., San Juan County, Utah	14-20-603-246-A Oct. 5, 1953	11.0652565
2	SE/4 and W/2 SW/4 Sec. 5, the irregular SW/4 Sec. 6, and all of Sec. 7 and 8, T-41-S, R-24-E, San Juan County, Utah	14-20-603-368 Oct. 26, 1953	14.4159942
3	SW/4 of Sec. 4, T-41-S, R-24-E, San Juan County, Utah	14-20-603-5446 Sept. 1, 1959	.5763826
4	SE/4 Sec. 4, and NE/4 Sec. 9, T-41-S, R-24-E, San Juan County, Utah	14-20-603-4035 March 3, 1958	1.2587779
5	SW/4 of Sec. 3, T-41-S, R-24-E, S.L.M., San Juan County, Utah	14-20-603-5445 Sept. 3, 1959	.4667669
6	NW/4 of Sec. 9, T-41-S, R-24-E, S.L.M., San Juan County, Utah	14-20-603-5045 Feb. 4, 1959	1.0187043
7	NW/4, W/2 NE/4, and SW/4 Sec. 10, SE/4 Sec. 9, T-41-S, R-24-E, San Juan County, Utah	14-20-603-4043 Feb. 18, 1958	3.5097575
8	SW/4 Sec. 9, T-41-S, R-24-E, S.L.M., San Juan County, Utah	14-20-603-5046 Feb. 4, 1959	1.1141679
9	SE/4 Sec. 10 and S/2 SW/4 Sec. 11 T-41-S, R-24-E, San Juan County, Utah	14-20-603-4037 Feb. 14, 1958	2.6186804
10	All of Sec. 13, E/2 Sec. 14, and E/2 SE/4 and N/2 Sec. 24, T-41-S, R-23-E, S.L.M., San Juan County, Utah	14-20-603-247-A Oct. 5, 1953	10.3108861
11	Sections 17, 18, 19 and 20, T-41-S, R-24-E, San Juan County Utah	14-20-603-353 Oct. 27, 1953	27.3389265
12	Sections 15, 16, 21, and NW/4, and W/2 SW/4 Sec. 22, T-41-S, R-24-E, San Juan County, Utah	14-20-603-355 Oct. 27, 1953	14.2819339
13	W/2 Section 14, T-41-S, R-24-E, San Juan County, Utah	14-20-603-370 Oct. 26, 1953	1.8500847
14	N/2 and SE/4, and E/2 SW/4 Sec. 29, NE/4 and E/2 SE/4 and E/2 W/2 irregular Sec. 30, and E/2 NE/4 Sec. 32, T-41-S, R-24-E, San Juan County, Utah	14-20-603-407 Dec. 10, 1953	6.9924969
15	NW/4 Sec. 28, T-41-S, R24-E San Juan County, Utah	14-20-603-409 Dec. 10, 1953	.9416393
16	SE/4 Sec. 3, T-41-S, R-24-E San Juan County, Utah	14-20-0603-6504 July 11, 1961	.5750254
17	NE/4 Sec. 3, T-41-S, R-24-E San Juan County, Utah	14-20-0603-6505 July 11, 1961	.5449292
18	NW/4 Sec. 3, T-41-S, R-24-E San Juan County, Utah	14-20-0603-6506 July 11, 1961	.5482788
19	NE/4 Sec. 4, T-41-S, R24-E San Juan County, Utah	14-20-0603-7171 June 11, 1962	.4720628
20	E/2 NW/4 Sec. 4, T-41-S, R-24-E San Juan County, Utah	14-20-0603-7172 June 11, 1962	.0992482

100% Indian Lands

TOTAL 12,909.74

100.0000000

PHONE CONVERSATION DOCUMENTATION FORM

Route original/copy to:

☐ Well File _____☐ Suspense _____☒ Other
OPERATOR CHANGE

(Location) Sec _____ Twp _____ Rng _____

(Return Date) _____

(API No.) _____

(To - Initials) _____

1. Date of Phone Call: 10-6-93 - Time: 9:302. DOGM Employee (name) L. CORDOVA (Initiated Call ☒
Talked to:Name GLEN COX (Initiated Call ☐ - Phone No. (915) 688-2114of (Company/Organization) MOBIL3. Topic of Conversation: OPERATOR CHANGE FROM PHILLIPS TO MOBIL "RATHERFORD UNIT".
(NEED TO CONFIRM HOW OPERATOR WANTS THE WELLS SET UP - MEPNA AS PER BIA APPROVAL
OR MOBIL OIL CORPORATION AS PER SUNDRY DATED 9-8-93?)

4. Highlights of Conversation: _____

MR. COX CONFIRMED THAT THE WELLS SHOULD BE SET UNDER ACCOUNT N7370/MEPNA AS
PER BIA APPROVAL, ALSO CONFIRMED THAT PRODUCTION & DISPOSITION REPORTS WILL NOW
BE HANDLED OUT OF THEIR CORTEZ OFFICE RATHER THAN DALLAS.MEPNA-PO DRAWER GCORTEZ, CO 81321(303) 565-2212*ADDRESS CHANGE AFFECTS ALL WELLS CURRENTLY OPERATED BY MEPNA, CURRENTLY
REPORTED OUT OF DALLAS (MCELMO CREEK).

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

OCT 25 1993

TRANSFER OF AUTHORITY TO INJECT - UIC FORM 5

Well name and number: _____
Field or Unit name: RATHERFORD UNIT API no. _____
Well location: QQ _____ section _____ township _____ range _____ county _____
Effective Date of Transfer: July 1, 1993

CURRENT OPERATOR

Transfer approved by:

Name Ed Hasely Company Phillips Petroleum Company
Signature Ed Hasely Address 5525 HWY. 64
Title Environmental Engineer Farmington, NM 87401
Date October 22, 1993 Phone (505) 599-3460

Comments:

NEW OPERATOR

Transfer approved by:

Name Shirley Todd Company Mobil Exploration & Producing North America
Signature Shirley Todd Address P O Box 633
Title Env. & Reg. Technician Midland, TX 79702
Date October 7, 1993 Phone (915) 688-2585

Comments:

(State use only)
Transfer approved by [Signature] Title NEC Manager
Approval Date 10-27-93

Lisha Cordova (801) 538-5340

BEFORE THE OIL AND GAS CONSERVATION COMMISSION OF THE STATE OF UTAH

APPLICATION OF PHILLIPS PETROLEUM)
 COMPANY FOR THE APPROVAL OF THE)
 UNIT OPERATIONS AND PRESSURE MAIN-) CAUSE NO. 53
 TENANCE PROGRAM FOR THE RATHERFORD)
 UNIT IN THE GREATER ANETH AREA,)
 SAN JUAN COUNTY, UTAH)

ORDER

This Cause came on for hearing before the Oil and Gas Conservation Commission of the State of Utah at 10 o'clock a. m. on Wednesday, September 13, 1961, in the Crystal Room, Hotel Newhouse, Fourth South at Main Street, Salt Lake City, Utah, pursuant to notice duly and regularly given. The entire Commission, except Walter G. Mann, was present, Edward W. Clyde presiding. Appearances were made as follows: Cecil C. Hamilton, attorney, on behalf of Phillips Petroleum Company; Clair H. Senior, attorney, on behalf of Texaco, Inc.; Gordon Mayberry, attorney, on behalf of Continental Oil Company; R. R. Robison on behalf of Shell Oil Company. Others present included Carl Trawick, on behalf of United States Geological Survey; and J. R. White, on behalf of Texaco, Inc.

Evidence in support of the application was introduced by Phillips Petroleum Company, the applicant and Unit Operator of the Ratherford Unit, which embraces as the unit area the following described land in San Juan County, State of Utah, to wit:

TOWNSHIP 41 SOUTH, RANGE 23 EAST, SLN

Section 1:	All	Sections 12 and 13:	All
Section 2:	S/2	Section 14:	S/2
Section 11:	S/2	Section 24:	All

TOWNSHIP 41 SOUTH, RANGE 24 EAST, SLN

Section 3:	SW/4	Sections 15	
Section 4:	S/2	through 21:	All
Sections 5 through 9:	All	Section 22:	NW/4 and S/2 of the SW/4
Section 10:	S/2 and NE/4 and S/2 of NE/4	Section 23:	NE/4 and S/2 of NE/4 and W/2 of SW/4
Section 11:	S/2 of SW/4	Section 29 and 30:	All
Section 14:	S/2	Section 31:	S/2
		Section 32:	S/2

R. R. Robison on behalf of Shell Oil Company stated that (as contemplated by paragraph No. 5 of the Commission's order of February 24, 1959, in Cause No. 17 authorizing the drilling of certain test wells) Shell would submit to the Commission, as arbiter, the question as between Shell and Superior Oil Company

of the monetary value, if any, to be attributed to three test wells drilled within the Ratherford Unit area pursuant to said order of February 24, 1959.

No objection to the granting of the application was filed or expressed. The Shell Oil Company, Texaco, Inc. and Continental Oil Company expressed their support of the application of Phillips Petroleum Company.

FINDINGS OF FACT

The Commission finds that:

1. The unitized operation of the Ratherford Unit Area will enable pressure maintenance operations to be initiated and permit such Area to be operated in a manner which will prevent waste, protect correlative rights and result in greater ultimate recovery of oil and gas.

2. The Ratherford Unit Agreement has been approved by the various signatory parties as fair, reasonable and acceptable.

3. The water injection pressure maintenance program proposed by the applicant appears to be proper and designed to result in the greatest economic recovery of oil and gas to the end that all concerned, including the general public, may realize and enjoy the greatest good from the oil and gas resources of the unitized lands.

ORDER

THEREFORE, IT IS ORDERED BY THE COMMISSION, and subject to its continuing jurisdiction, that:

1. Unit operation of the Ratherford Unit Area under the Ratherford Unit Agreement is approved.

2. The plan and program of water injection pressure maintenance operations proposed by applicant in its application filed herein should be and the same is hereby approved and the unit operator is authorized to proceed with and under such plan and program as soon as the Ratherford Unit Agreement becomes effective and operative.

3. If, at any time or from time to time, it appears necessary or desirable to the unit operator to alter or modify the hereby approved plan of pressure maintenance, any such alteration or modification shall be submitted for

and shall be subject to approval by the Commission or its delegated representative, which approval may be given without notice or hearing, unless otherwise ordered or directed by the Commission.

Dated this 13th day of September, 1961.

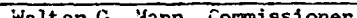
THE OIL AND GAS CONSERVATION
COMMISSION OF THE STATE OF UTAH


Edward W. Clyde, Commissioner presiding


C. R. Henderson, Chairman


M. V. Hatch, Commissioner


C. S. Thomson, Commissioner


Walter G. Mann, Commissioner

Division of Oil, Gas and Mining
OPERATOR CHANGE WORKSHEET

Routing:

1. VLC 7-93
2. DES 8-93
3. VLC
4. RJE
5. DES
6. PL

Attach all documentation received by the division regarding this change.
 Initial each listed item when completed. Write N/A if item is not applicable.

- ☒ Change of Operator (well sold) ☐ Designation of Agent
☐ Designation of Operator ☐ Operator Name Change Only

The operator of the well(s) listed below has changed (EFFECTIVE DATE: 7-1-93)

TO (new operator)	<u>M E P N A</u>	FROM (former operator)	<u>PHILLIPS PETROLEUM COMPANY</u>
(address)	<u>PO DRAWER G</u>	(address)	<u>5525 HWY 64 NBU 3004</u>
	<u>CORTEZ, CO 81321</u>		<u>FARMINGTON, NM 87401</u>
	<u>GLEN COX (915) 688-2114</u>		<u>PAT KONKEL</u>
	phone <u>(303) 565-2212</u>		phone <u>(505) 599-3452</u>
	account no. <u>N7370</u>		account no. <u>N0772(A)</u>

Well(s) (attach additional page if needed):

***RATHERFORD UNIT (NAVAJO)**

Name: **SEE ATTACHED**	API: <u>43 037-31153</u>	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____

OPERATOR CHANGE DOCUMENTATION

Sec 1. (Rule R615-8-10) Sundry or other legal documentation has been received from former operator (Attach to this form). *(Reg. 8-20-93) (6/93 Prod. Rpt. 8-16-93)*

Sec 2. (Rule R615-8-10) Sundry or other legal documentation has been received from new operator (Attach to this form). *(Reg. 8-31-93) (Prod. 9-14-93)*

N/A 3. The Department of Commerce has been contacted if the new operator above is not currently operating any wells in Utah. Is company registered with the state? (yes/no) ____ If yes, show company file number: _____.

Sec 4. (For Indian and Federal Wells ONLY) The BLM has been contacted regarding this change (attach Telephone Documentation Form to this report). Make note of BLM status in comments section of this form. Management review of **Federal and Indian** well operator changes should take place prior to completion of steps 5 through 9 below.

Sec 5. Changes have been entered in the Oil and Gas Information System (Wang/IBM) for each well listed above. *(O&G wells 10-6-93) (Wiw's 10-26-93)*

Sec 6. Cardex file has been updated for each well listed above. *(O&G wells 10-6-93) (Wiw's 10-26-93)*

Sec 7. Well file labels have been updated for each well listed above. *(O&G wells 10-6-93) (Wiw's 10-26-93)*

Sec 8. Changes have been included on the monthly "Operator, Address, and Account Changes" memo for distribution to State Lands and the Tax Commission. *(10-6-93)*

Sec 9. A folder has been set up for the Operator Change file, and a copy of this page has been placed there for reference during routing and processing of the original documents.

ENTITY REVIEW

- ☒ 1. (Rule R615-8-7) Entity assignments have been reviewed for all wells listed above. Were entity changes made? (yes/no) no (If entity assignments were changed, attach copies of Form 6, Entity Action Form).
- ☒ 2. State Lands and the Tax Commission have been notified through normal procedures of entity changes.

BOND VERIFICATION (Fee wells only)

- ☒ 1. (Rule R615-3-1) The new operator of any fee lease well listed above has furnished a proper bond.
- ☒ 2. A copy of this form has been placed in the new and former operators' bond files.
- ☒ 3. The former operator has requested a release of liability from their bond (yes/no) no. Today's date 11-17 1993. If yes, division response was made by letter dated 11-17 1993.

LEASE INTEREST OWNER NOTIFICATION RESPONSIBILITY

- ☒ 1. (Rule R615-2-10) The former operator/lessee of any fee lease well listed above has been notified by letter dated 11-17 1993, of their responsibility to notify any person with an interest in such lease of the change of operator. Documentation of such notification has been requested.
- ☒ 2. Copies of documents have been sent to State Lands for changes involving State leases.

FILMING

- ☒ 1. All attachments to this form have been microfilmed. Date: 11-17 1993.

FILING

- ☒ 1. Copies of all attachments to this form have been filed in each well file.
- ☒ 2. The original of this form and the original attachments have been filed in the Operator Change file.

COMMENTS

931006 BIA/BM Approved 7-9-93.

PHONE CONVERSATION DOCUMENTATION FORM

Route original/copy to:

☐ Well File _____

☐ Suspense _____

☒ Other _____

(Location) Sec _____ Twp _____ Rng _____

(Return Date) _____

OPER NM CHG _____

(API No.) _____

(To - Initials) _____

1. Date of Phone Call: 8-3-95 Time: _____

2. DOGM Employee (name) L. CORDOVA (Initiated Call ☐)
Talked to: _____

Name R. J. FIRTH (Initiated Call ☒) - Phone No. () _____

of (Company/Organization) _____

3. Topic of Conversation: M E P N A / N7370

4. Highlights of Conversation: _____

OPERATOR NAME IS BEING CHANGED FROM M E P N A (MOBIL EXPLORATION AND PRODUCING
NORTH AMERICA INC) TO MOBIL EXPLOR & PROD. THE NAME CHANGE IS BEING DONE AT
THIS TIME TO ALLEVIATE CONFUSION, BOTH IN HOUSE AND AMONGST THE GENERAL PUBLIC.

*SUPERIOR OIL COMPANY MERGED INTO M E P N A 4-24-86 (SEE ATTACHED).

Mobil Oil Corporation

P.O. BOX 5444
DENVER, COLORADO 80217-5444

May 14, 1986

Utah Board of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Attn: R. J. Firth
Associate Director

RECEIVED
MAY 16 1986

DIVISION OF
OIL, GAS & MINING

SUPERIOR OIL COMPANY MERGER

Dear Mr. Firth:

On September 20, 1984, The Superior Oil Company (Superior) became a wholly owned subsidiary of Mobil Corporation. Since January 1, 1985, Mobil Oil Corporation (MOC), another wholly owned subsidiary of Mobil Corporation, has acted as agent for Superior and has operated the Superior-owned properties.

On April 24, 1986, Superior was merged with Mobil Exploration and Producing North America Inc. (MEPNA), which is also a wholly owned subsidiary of Mobil Corporation. MEPNA is the surviving company of the merger.

This letter is to advise you that all properties held in the name of Superior will now be held in the name of MEPNA; and that these properties will continue to be operated by MOC as agent for MEPNA.

Attached is a listing of all wells and a separate listing of injection-disposal wells, Designation of Agent and an organization chart illustrating the relationships of the various companies. If you have any questions or require additional documentation of this merger, please feel free to contact me at the above address or (303) 298-2577.

Very truly yours,



CNE/rd
CNE8661

R. D. Baker
Environmental Regulatory Manager

STATE OF UTAH
INVENTORY OF INJECTION WELLS

OPERATOR	API NO.	WELL	TNS	RGE	SE	WELLTYPE	INDIAN COUNT
*****	*****	*****	***	***	**	*****	*****
✓MEPNA (MOBIL	43-037-15722	16W23	41S	24E	16	INJW	Y
✓MEPNA (MOBIL	43-037-16414	16W21	41S	24E	16	INJW	Y
✓MEPNA (MOBIL	43-037-16416	17W21	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-15726	17W12	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-15731	17W41	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-16417	17W43	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-15728	17W23	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-15730	17W34	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-15729	17W32	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-15727	17W14	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-31153	18W12	41S	24E	18	INJW	Y
✓MEPNA (MOBIL	43-037-15737	18W34	41S	24E	18	INJW	Y
✓MEPNA (MOBIL	43-037-15736	18W32	41S	24E	18	INJW	Y
✓MEPNA (MOBIL	43-037-30244	18W23	41S	24E	18	INJW	Y
✓MEPNA (MOBIL	43-037-15735	18W14	41S	24E	18	INJW	Y
✓MEPNA (MOBIL	43-037-16418	18W21	41S	24E	18	INJW	Y
✓MEPNA (MOBIL	43-037-15738	18W41	41S	24E	18	INJW	Y
✓MEPNA (MOBIL	43-037-15741	19W21	41S	24E	19	INJW	Y
✓MEPNA (MOBIL	43-037-15742	19W23	41S	24E	19	INJW	Y
✓MEPNA (MOBIL	43-037-15745	19W41	41S	24E	19	INJW	Y
✓MEPNA (MOBIL	43-037-16420	19W43	41S	24E	19	INJW	Y
✓MEPNA (MOBIL	43-037-15748	20W23	41S	24E	20	INJW	Y
✓MEPNA (MOBIL	43-037-15751	20W41	41S	24E	20	INJW	Y
✓MEPNA (MOBIL	43-037-16423	20W21	41S	24E	20	INJW	Y
✓MEPNA (MOBIL	43-037-16424	20W43	41S	24E	20	INJW	Y
✓MEPNA (MOBIL	43-037-16427	21W43	41S	24E	21	INJW	Y
✓MEPNA (MOBIL	43-037-16425	21W21	41S	24E	21	INJW	Y
✓MEPNA (MOBIL	43-037-16431	28W21	41S	24E	28	INJI	Y
✓MEPNA (MOBIL	43-037-16433	29W41	41S	24E	29	INJW	Y
✓MEPNA (MOBIL	43-037-16432	29W21	41S	24E	29	INJW	Y
✓MEPNA (MOBIL	43-037-15338	29W23	41S	24E	29	INJI	Y
✓MEPNA (MOBIL	43-037-16434	29W43	41S	24E	29	INJW	Y
✓MEPNA (MOBIL	43-037-15343	30-41	41S	24E	30	INJW	Y
✓MEPNA (MOBIL	43-037-16435	30W21	41S	24E	30	INJI	--

Division of Oil, Gas and Mining
OPERATOR CHANGE WORKSHEET

Routing

1-LEC	7-PL
2-LWP	8-SJ
3-DTS	9-FILE
4-VLC	
5-RJF	
6-LWP	

Attach all documentation received by the division regarding this change.
 Initial each listed item when completed. Write N/A if item is not applicable.

- ☐ Change of Operator (well sold) ☐ Designation of Agent
☐ Designation of Operator ☒ Operator Name Change Only

The operator of the well(s) listed below has changed (EFFECTIVE DATE: 8-2-95)

TO (new operator) MOBIL EXPLOR & PROD
 (address) C/O MOBIL OIL CORP
PO DRAWER G
CORTEZ CO 81321
 phone (303) 564-5212
 account no. N7370

FROM (former operator) M E P N A
 (address) C/O MOBIL OIL CORP
PO DRAWER G
CORTEZ CO 81321
 phone (303) 564-5212
 account no. N7370

Well(s) (attach additional page if needed):

Name: ** SEE ATTACHED **	API: <u>037-31153</u>	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____

OPERATOR CHANGE DOCUMENTATION

- N/A 1. (Rule R615-8-10) Sundry or other legal documentation has been received from former operator (Attach to this form).
- N/A 2. (Rule R615-8-10) Sundry or other legal documentation has been received from new operator (Attach to this form).
- N/A 3. The Department of Commerce has been contacted if the new operator above is not currently operating any wells in Utah. Is company registered with the state? (yes/no) ____ If yes, show company file number: _____.
- N/A 4. (For Indian and Federal Wells ONLY) The BLM has been contacted regarding this change (attach Telephone Documentation Form to this report). Make note of BLM status in comments section of this form. Management review of **Federal and Indian** well operator changes should take place prior to completion of steps 5 through 9 below.
- lec 5. Changes have been entered in the Oil and Gas Information System (Wang/IBM) for each well listed above. (8-3-95)
- LWP 6. Cardex file has been updated for each well listed above. 8-21-95
- LWP 7. Well file labels have been updated for each well listed above. 9-28-95
- lec 8. Changes have been included on the monthly "Operator, Address, and Account Changes" memo for distribution to State Lands and the Tax Commission. (8-3-95)
- lec 9. A folder has been set up for the Operator Change file, and a copy of this page has been placed there for reference during routing and processing of the original documents.

ENTITY REVIEW

- Lee* 1. (Rule R615-8-7) Entity assignments have been reviewed for all wells listed above. Were entity changes made? (yes/no) no (If entity assignments were changed, attach copies of Form 6, Entity Action Form).
- N/A* 2. State Lands and the Tax Commission have been notified through normal procedures of entity changes.

BOND VERIFICATION (Fee wells only) ** No Fee Lease Wells at this time!*

- N/A* *Lee* 1. (Rule R615-3-1) The new operator of any fee lease well listed above has furnished a proper bond.
- ___ 2. A copy of this form has been placed in the new and former operators' bond files.
- ___ 3. The former operator has requested a release of liability from their bond (yes/no) _____. Today's date _____ 19____. If yes, division response was made by letter dated _____ 19____.

LEASE INTEREST OWNER NOTIFICATION RESPONSIBILITY

- N/A* *UTS* *8/5/95* 1. (Rule R615-2-10) The former operator/lessee of any **fee lease** well listed above has been notified by letter dated _____ 19____, of their responsibility to notify any person with an interest in such lease of the change of operator. Documentation of such notification has been requested.
- N/A* 2. Copies of documents have been sent to State Lands for changes involving State leases.

FILMING

- ✓* 1. All attachments to this form have been microfilmed. Date: October 4 1995.

FILING

- ___ 1. Copies of all attachments to this form have been filed in each well file.
- ___ 2. The original of this form and the original attachments have been filed in the Operator Change file.

COMMENTS

950803 LIC F5/Not necessary!

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

1. Type of Well

☐ Oil Well ☐ Gas Well ☒ Other INJECTOR / SIDETRACK

2. Name of Operator Mobil Exploration & Producing U.S. Inc.
as Agent for Mobil Producing TX & NM Inc.

3. Address and Telephone No.

P.O. Box 633, Midland, TX 79702 915-688-2585

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

1980' FNL & 560' FWL
SEC.18, T41S, R24E

FORM APPROVED

Budget Bureau No. 1004-0135

Expires: March 31, 1993

5. Lease Designation and Serial No.

14-20-603-353

6. If Indian, Allottee or Tribe Name

NAVAJO TRIBAL

7. If Unit or CA, Agreement Designation

RATHERFORD UNIT

8. Well Name and No.

RATHERFORD 18-W-12

9. API Well No.

43-037-31153

10. Field and Pool, or exploratory Area

GREATER ANETH

11. County or Parish, State

SAN JUAN UT

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

- ☒ Notice of Intent
☐ Subsequent Report
☐ Final Abandonment Notice

TYPE OF ACTION

- ☐ Abandonment
☐ Recompletion
☐ Plugging Back
☐ Casing Repair
☐ Altering Casing
☒ Other SIDETRACK
☐ Change of Plans
☐ New Construction
☐ Non-Routine Fracturing
☐ Water Shut-Off
☐ Conversion to Injection
☐ Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

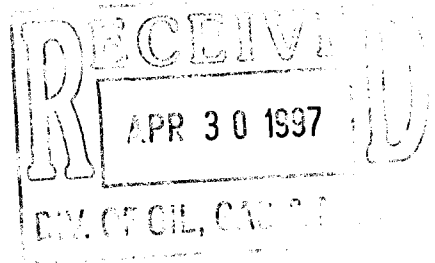
13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

BOTTOM HOLE LOCATIONS:

LEG #1: 775' SOUTH & 1342' EAST FROM SURFACE SPOT (ZONE 1a).

LEG #2: 1805' NORTH & 2396' WEST FROM SURFACE SPOT (ZONE 1a).

SEE ATTACHED PROCEDURE.



14. I hereby certify that the foregoing is true and correct

Signed

Shirley Houchens

Title ENV. & REG. TECHNICIAN

Date 04-22-97

(This space for Federal or State office use)

Approved by

John R. Bay

Title

Petroleum Engineer

Date

5/7/97

Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

* See Instruction on Reverse Side

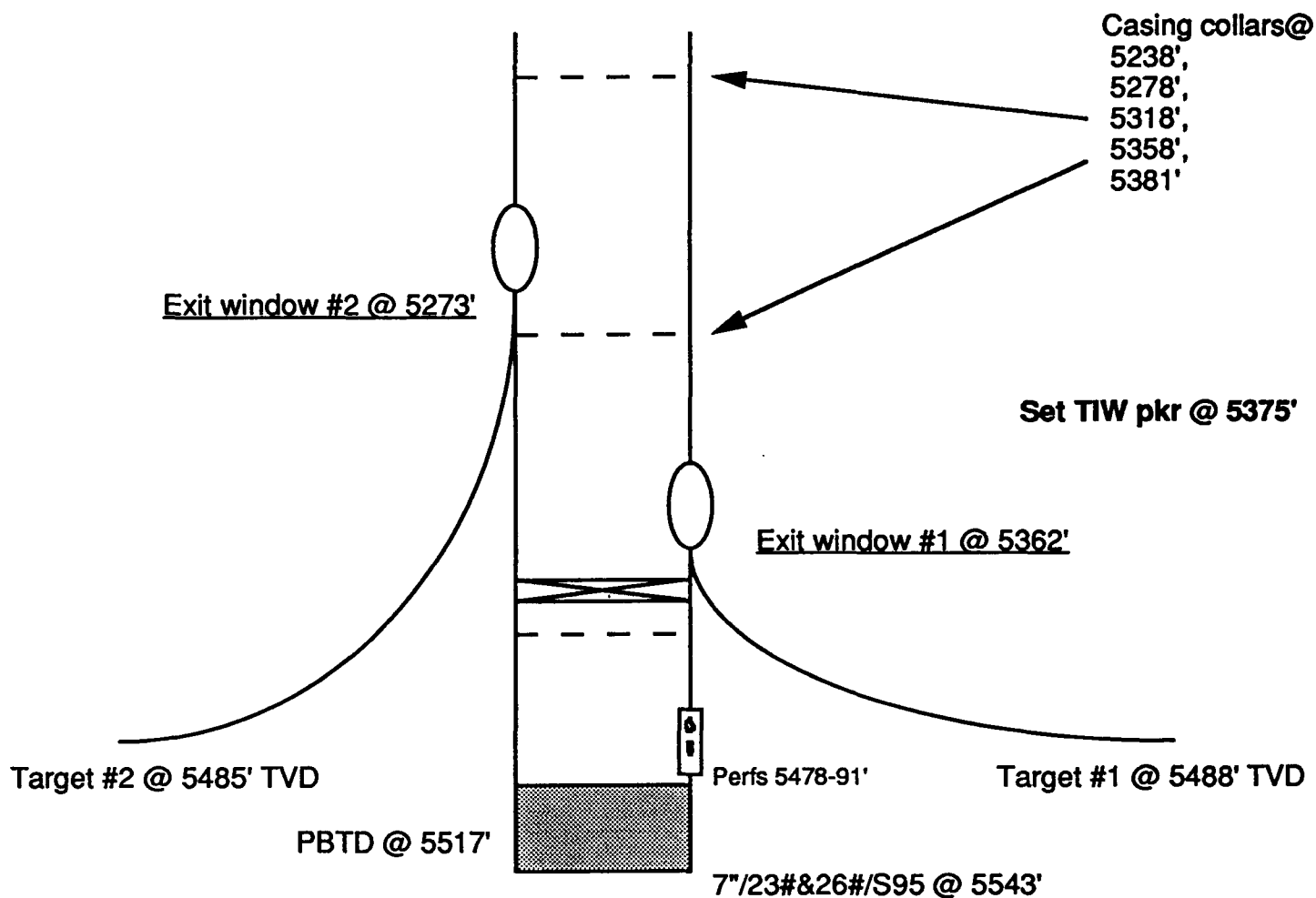
Ratherford Unit Well #18-12 Multilateral Horizontal Drilling Procedure

The objective of this procedure is to prepare this wellbore for sidetracking, sidetrack the subject well and drill multiple short and medium radius horizontal laterals (1200-3000 ft).

1. Prepare location and dig working pit.
2. MIRU WSU, reverse unit, and H₂S equipment. Bullhead kill weight fluid down tubing.
3. Release packer, and pick up on wellhead to remove. ND wellhead and NU BOP's. Pressure test BOP's.
4. Continue to POH with tubing.
5. TIH with full gauge bit and casing scraper to PBTD. TOH with bit and scraper.
6. Ensure well will circulate, and set RTBP above perms. Pressure test casing to 1000 psi.
7. RDMO WSU.
8. MIRU 24 hr WSU.
9. PU tubing, drill collars, and drill pipe in derrick and run in hole. Then POH and stand back.
10. RU wireline company and run gauge ring for casing down to packer setting depth.
11. Run packer on wireline and set using GR/CCL log to correlate with. RD wireline.
12. PU drillpipe with UBHO sub and latch assembly.
13. Latch into packer. Run gyro and obtain orientation of keyway on packer.
14. POH w/ gyro. POH w/ drill pipe and RIH w/ whipstock oriented on the surface for window azimuth desired.
15. Shear pilot mill bolt and start milling window.
16. POH and PU window mill and watermelon mill to finish window and drill 3 ft of formation.
17. POH w/ mills and RBIH w/ new mills to clean up window.
18. PU drill pipe and directional motors to drill curve. Use the gyro to drill until the inclination dictates that the gyro must be pulled.
19. Pull five stands of drill pipe and run steering tool to finish drilling the curve.
20. POH once curve is finished and PU lateral motor to drill the lateral using MWD.

21. Once lateral TD is reached, POH w/ directional equipment.
22. RIH w/ hook and retrieve whipstock.
23. PU new whipstock with extension in body for next window and orient on surface to desired azimuth.
24. Repeat steps 15-23, for each successive planned lateral.

Whipstock plan for Ratherford #18-12



Window	Btm-Top of window	Extension length	Curve radius	Bearing	Horiz Displ
1	5362-51	-	126	120	1550
2	5273-62	94	212	307	3000

*The double spline is 2.42 ft long and the bottom of the whipstock, latch, and debris sub are 5.68 ft long. These lengths must be added to the extension lengths to determine the entire whipstock assembly length. 8.1 ft should be added to the extension length above.

RATHERFORD UNIT # 18W-12

GREATER ANETH FIELD

1980' FNL & 560' FWL

SEC 18-T41S-R24E

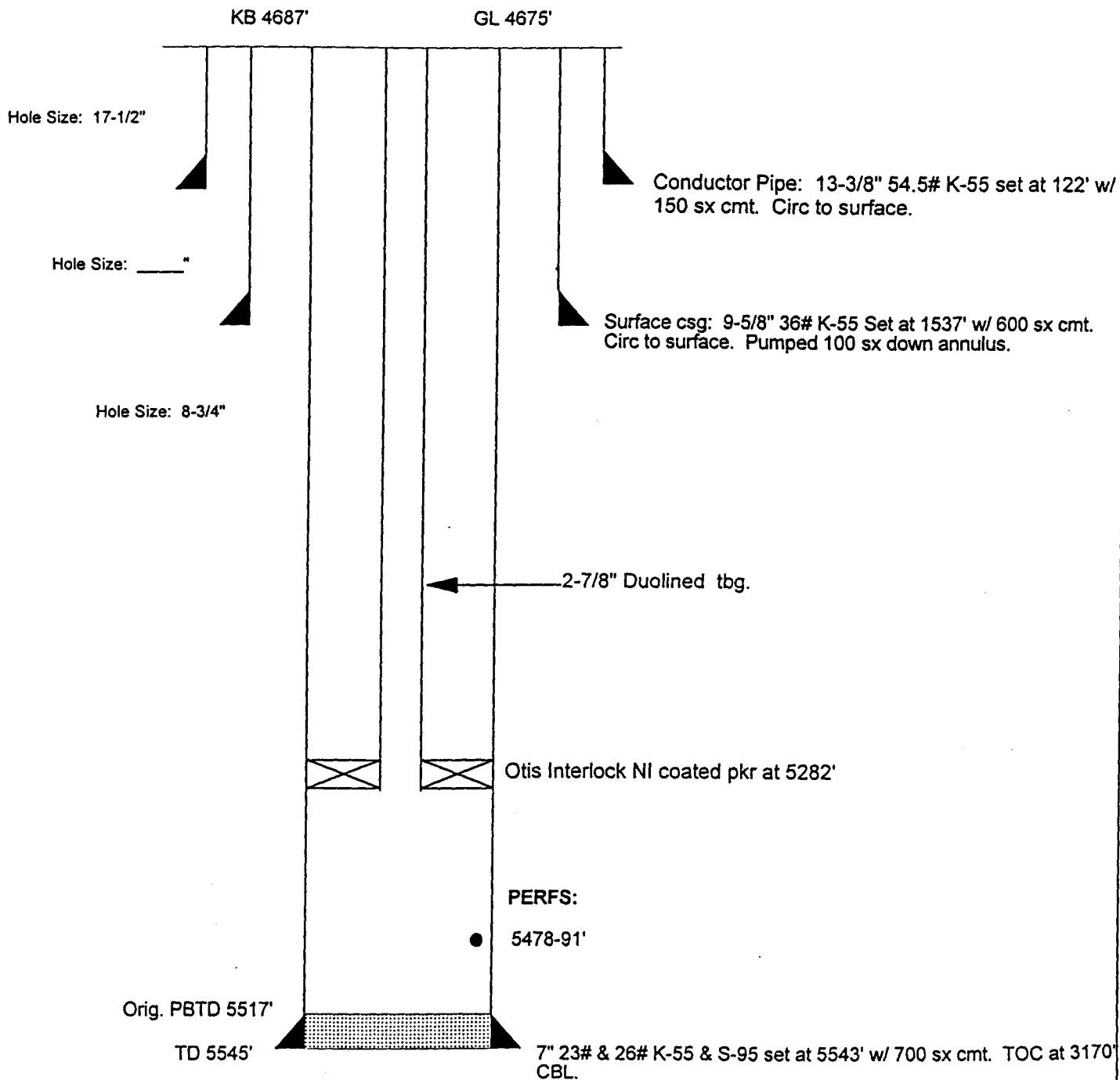
SAN JUAN COUNTY, UTAH

API 43-037-31153

PRISM 0043061

INJECTOR

Capacities:	bbl/ft	gal/ft	cuft/ft
2-7/8" 6.5#	.00579	.2431	.0325
7" 23#	.0393	1.6535	.2210
7" 26#	.0382	1.6070	.2148
2-7/8x7"23#	.0313	1.3162	.1760
2-7/8x7"26#	.0302	1.2698	.1697



WORKSHEET
APPLICATION FOR PERMIT TO DRILL

APD RECEIVED: 04/30/97

API NO. ASSIGNED: 43-037-31153

WELL NAME: RATHERFORD UNIT 18-W-12
OPERATOR: MOBIL EXPL & PROD (N7370)

PROPOSED LOCATION:

SWNW 18 - T41S - R24E
SURFACE: 1980-FNL-0560-FWL
BOTTOM: ~~0760-FNL-1880-FEL~~ *See comments*
SAN JUAN COUNTY
GREATER ANETH FIELD (365)

LEASE TYPE: IND
LEASE NUMBER: 14-20-603-353

PROPOSED PRODUCING FORMATION: DSCR

INSPECT LOCATION BY: / /		
TECH REVIEW	Initials	Date
Engineering		
Geology		
Surface		

RECEIVED AND/OR REVIEWED:

☐ Plat
☐ Bond: Federal ☐ State ☐ Fee ☐
 (Number _____)
☐ Potash (Y/N)
☐ Oil shale (Y/N)
☐ Water permit
 (Number _____)
☐ RDCC Review (Y/N)
 (Date: _____)

LOCATION AND SITING:

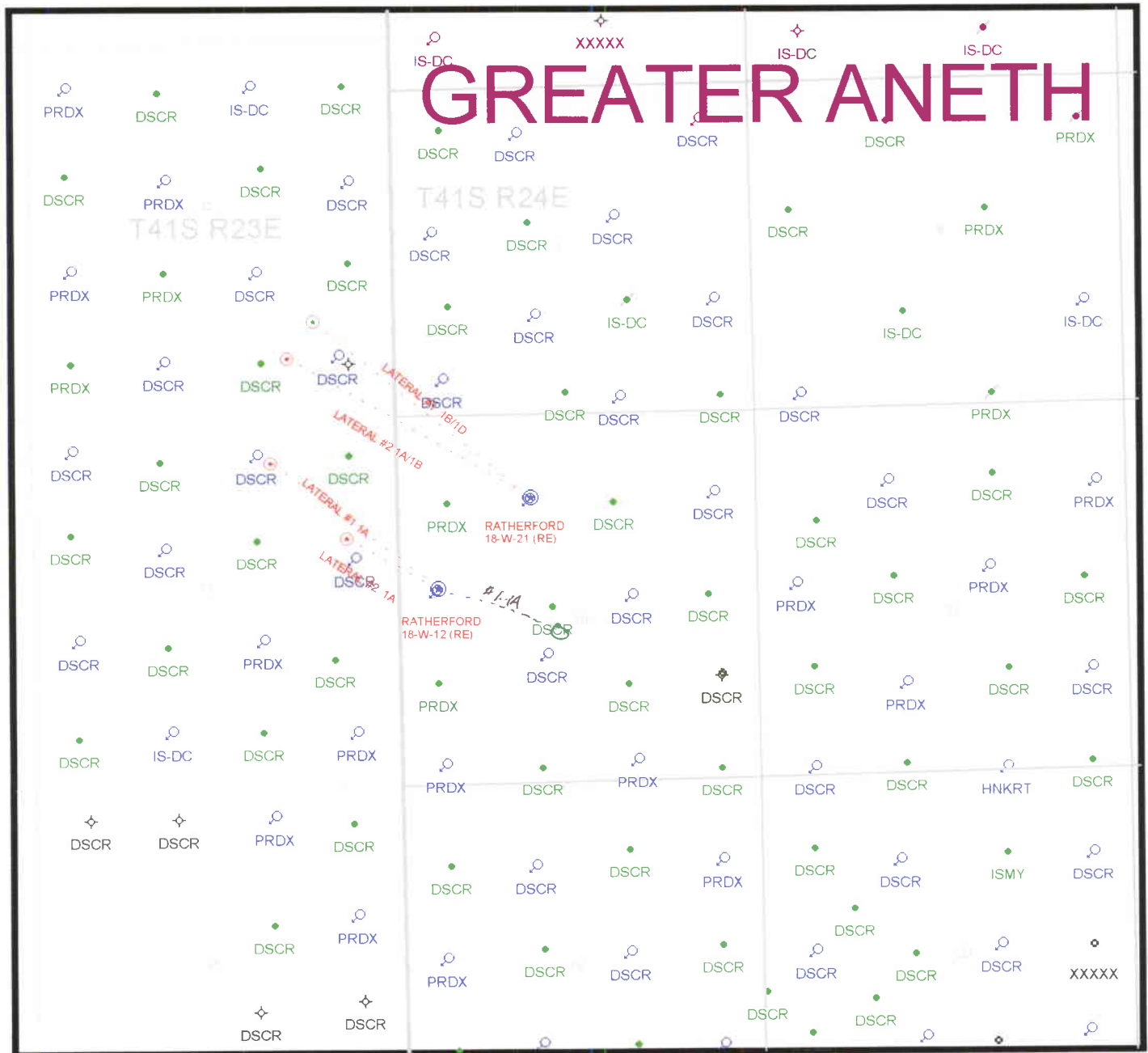
☒ R649-2-3. Unit: Ratherford
☐ R649-3-2. General.
☐ R649-3-3. Exception.
☐ Drilling Unit.
 Board Cause no: _____
 Date: _____

COMMENTS: Navajo tribal land - Sundry notice accepted as APD.

BHL lateral #1 - 2525' FSL, 1902' FWL, Sec. 16, T. 41S, R. 24E
BHL lateral #2 - 175' FNL, 1836' FEL, Sec. 13, T. 41S, R. 23E

STIPULATIONS: 1- Directional drilling.

OPERATOR: MOBIL (N7370)
FIELD: GREATER ANETH (365)
SEC, TWP, RNG: 18, T41S, R24E
COUNTY: SAN JUAN
UAC: R649-2-3 (RATHERFORD UNIT)



PREPARED:
DATE: 1-MAY-97



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor

Ted Stewart
Executive Director

James W. Carter
Division Director

1594 West North Temple, Suite 1210

Box 145801

Salt Lake City, Utah 84114-5801

801-538-5340

801-359-3940 (Fax)

801-538-7223 (TDD)

May 7, 1997

Mobil Exploration & Producing
P.O. Box 633
Midland, Texas 79702

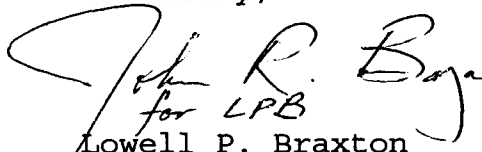
Re: Ratherford 18-W-12 Well, 1980' FNL, 560' FWL, SW NW,
Sec. 18, T. 41 S., R. 24 E., San Juan County, Utah

Gentlemen:

Pursuant to the provisions and requirements of Utah Code Ann. 40-6-1 et seq., Utah Administrative Code R649-3-1 et seq., and the attached Conditions of Approval, approval to re-enter and drill the referenced well is granted.

This approval shall expire one year from the above date unless substantial and continuous operation is underway, or a request for extension is made prior to the expiration date. The API identification number assigned to this well is 43-037-31153.

Sincerely,


for LPB
Lowell P. Braxton
Deputy Director

lwp

Enclosures

cc: San Juan County Assessor

Bureau of Land Management, Moab District Office

Operator: Mobil Exploration & Producing
Well Name & Number: Ratherford 18-W-12
API Number: 43-037-31153
Lease: 14-20-603-353
Location: SW NW Sec. 18 T. 41 S. R. 24 E.

Conditions of Approval

1. General

Compliance with the requirements of Utah Admin. R. 649-1 et seq., the Oil and Gas Conservation General Rules, and the applicable terms and provisions of the approved Application for Permit to Drill.

2. Notification Requirements

Notify the Division within 24 hours following spudding the well or commencing drilling operations. Contact Jimmie Thompson at (801)538-5336.

Notify the Division prior to commencing operations to plug and abandon the well. Contact John R. Baza (801)538-5334 or Mike Hebertson at (801) 538-5333.

3. Reporting Requirements

All required reports, forms and submittals shall be promptly filed with the Division, including but not limited to the Entity Action Form (Form 6), Report of Water Encountered During Drilling (Form 7), Weekly Progress Reports for drilling and completion operations, and Sundry Notices and Reports on Wells requesting approval of change of plans or other operational actions.

4. In accordance with Utah Admin. R. 649-3-11, Directional Drilling, submittal of a complete angular deviation and directional survey report is required.



ROCKY MOUNTAIN GEO-ENGINEERING

Well Logging • Consulting Geology • Coal Bed Methane Services • Computerized Logging Equipment & Software

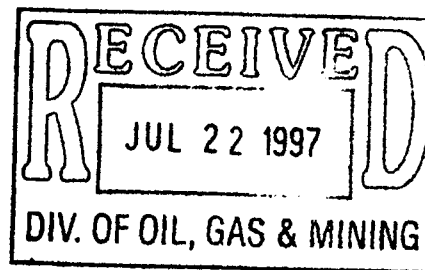
ROCKY MOUNTAIN GEO-ENGINEERING CORP.

2450 INDUSTRIAL BLVD. • GRAND JUNCTION, CO 81505

(970) 243-3044 • (FAX) 241-1085

Thursday, July 17, 1997

Division of Oil & Gas Mining
State of Utah
355 W. North, Suite 350
Salt Lake City, UT 84180-1203



Re: Ratherford Unit #18-12 Legs 1 & 2
Sec. 18, T41w, R24E
San Juan County, Utah

Dear Sirs:

Enclosed are the final computer colored logs and geology reports for the above referenced well.
WITH DOWN-HOLE LOSS

We appreciate the opportunity to be of service to you and look forward to working with you again in the near future.

If you have any questions regarding the enclosed data, please contact us.

Sincerely,

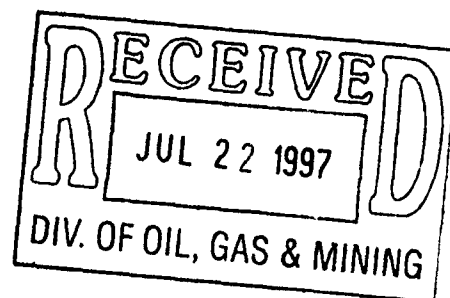
Bill Nagel
Senior Geologist

BN/dn

Enc. 1 Final Computer Colored Log & 1 Geology Report

cc Letter Only; Dana Larson; Mobil E & P U.S., Inc.; Midland, TX

MICROFICHE



MOBIL
43 03731153
RATHERFORD UNIT #18-12
SE HORIZONTAL LATERAL LEG #1
UPPER 1-A POROSITY BENCH
DESERT CREEK MEMBER
PARADOX FORMATION
SECTION 18, T41S, R23E R24E
SAN JUAN, UTAH

GEOLOGY REPORT
by
DAVE MEADE & MARVIN ROANHORSE
ROCKY MOUNTAIN GEO-ENGINEERING CORP.
GRAND JUNCTION, COLORADO
(970) 243-3044

MICROFICHE

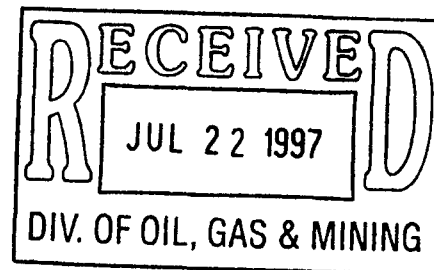


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WELL SUMMARY

OPERATOR: MOBIL EXPLORATION & PRODUCTION U.S. INC.

NAME: RATHERFORD UNIT #18-12 SE HORIZONTAL LATERAL
LEG #1 IN 1-A UPPER POROSITY BENCH, DESERT CREEK

LOCATION: SECTION 18, T41S, R23E

COUNTY/STATE: SAN JUAN, UTAH

ELEVATION: KB:4687' GL:4675'

SPUD DATE: 6/28/97

COMPLETION DATE: 7/06/97

DRILLING ENGINEER: BENNY BRIGGS / LEWIS SIMMONS

WELLSITE GEOLOGY: DAVE MEADE / MARVIN ROANHORSE

**MUDLOGGING
ENGINEERS:** DAVE MEADE / MARVIN ROANHORSE

CONTRACTOR: BIG "A" RIG 25
TOOLPUSHER: J. DEES

HOLE SIZE: 4 3/4"

CASING RECORD: SIDETRACK IN WINDOW AT 5377' MEASURED DEPTH

DRILLING MUD: M-I
ENGINEER: RON WESTENBERG/ DANNE BEASON
MUD TYPE: FRESH WATER & BRINE WATER W/ POLYMER SWEEPS

**DIRECTIONAL
DRILLING CO:** SPERRY-SUN

ELECTICAL LOGGING: NA

TOTAL DEPTH: 9124' MEASURED DEPTH TVD- 5473.2'

STATUS: TOH & LAY DOWN TOOLS - PREPARE FOR LATERAL LEG #2

DRILLING CHRONOLOGY
RATHERFORD UNIT #18-12
1-A SE HORIZONTAL LATERAL LEG #1

DATE	DEPTH	DAILY	ACTIVITY
6/27/97	0'	0'	RIG DOWN & MOVE RIG-RIG UP-NIPPLE UP-TEST BOP-PICK UP RETRIEVING HOOK-NIPPLE DOWN HYDRILL & REMOVE HYDRILL
6/28/97	0'	0'	W.O. HYDRILL-NIPPLE UP HYDRILL-PICK UP RETRIEVING TOOL-TIH-LATCH IN TO & RELEASE BRIDGE PLUG-BLEED OFF WELL-TOH-RIG UP WEATHERFORD-TO MAKE SCRAPER RUN & SET PACKER @ 5385'-RIG DOWN WEATHERFORD-TIH W/LATCH ASSEMBLY-SET WHIPSTOCK-REVERSE OUT & PUMP 11 BBL MUD-RIG UP GYRO & CHECK ORIENTATION OF PACKER
6/29/97	5385'	9'	TOH & LAY DOWN ANCHOR ASSEMBLY-PICK UP & ORIENT WHIPSTOCK & STARTER MILL-TIH W/WHIPSTOCK-SET & SHEAR OFF WHIPSTOCK @ 5362'-MILL W/STARTER MILL-PUMP 8 BBL SWEEP & CIR OUT-TOH-LAY DOWN STARTER MILL-PICK UP WINDOW MILL & WATERMELLON MILL-TIH-BREAK CIR- MILL WINDOW 5368'-5377'-PUMP 2 HIGH VIS SWEEPS-TOH-L.D. LAY DOWN 15 JTS AOH DRILL PIPE
6/30/97	5377'	90'	TOH-LAY DOWN MILL ASSEMBLY-CUT 80' DRILLING LINE-PICK UP MWD & CURVE ASSEMBLY-TIH-BREAK CIR & TAG WHIPSTOCK-RIG UP WIRELINE & CHECK SURVEYS-TIME DRLG 5377'-5381'-DIR DRLG 5381'-5419'-PULL GYRO & RIG DOWN GYRO DATA WIRE LINE
7/01/97	5467'	304'	DIR DRILLING & SURVEYS-PUMP 10 BBL SWEEP -CIR OUT SWEEP & SAMPLES @ 5562'-TOOH-BREAK & LAY DOWN CURVE ASSEMBLY-PICK UP LATERAL BHA & BIT #2-PICK UP 1 JNT PH6 DRLG PIPE-TIH-DIR DRLG & SURVEYS
7/02/97	5771'	889'	DIR DRLG & SURVEYS
7/03/97	6660'	560'	DIR DRLG & SURVEYS TO 7099'-SHUT IN WELL DUE TO FLOW-SIDP 350 psi/CASING-650 psi -BLEED OFF PRESS-TOH TO2375'-TIH 37 STDS & LAY DOWN 74 JNTS D.P.-STRAP 60 JNTS PH-6-PICK UP60 JNTS TUBING-H2S ALARM SOUNDS @ 30 ppm @ SH SHAKER-SPOT BUG FANS AROUND SHAKER AREA-TIH-PICK UP14 DRLG COLLARS-BREAK CIR.-DIR DRLG & SURVEYS
7/04/97	7220'	1055'	DIR DRLG & SURVEYS
7/05/97	8275'	818'	DIR DRLG & SURVEYS

DRILLING CHRONOLOGY
RATHERFORD UNIT #18-12
1-A SE HORIZONTAL LATERAL LEG #1

DATE	DEPTH	DAILY	ACTIVITY
7/06/97	9093'	31'	DIR DRLG & SURVEYS TD @ 9124'-PUMP SWEEPS & CIR SAMPLES UP-TOOH & LAY DOWN 66 STDS DRL PIPE- DISPLACE HOLE W/BRINE WATER-TOH-LAY DOWN LATERAL ASSEMBLY-PICK UP RETRIEVING HOOK-TIH-LATCH INTO WHIPSTOCK-TOH W/WHIPSTOCK-P.U. & ORIENT WHIPSTOCK- TIH-SET WHIPSTOCK @ 5291'-TOH

DAILY ACTIVITY

Operator: MOBIL

Well Name: RATHERFORD UNIT #18-12 SE 1-A HORIZONTAL LATERAL LEG #1

DATE	DEPTH	DAILY	DATE	DEPTH	DAILY
6/27/97	0'	0'			
6/28/97	0'	0'			
6/29/97	5385'	9'			
6/30/97	5377'	90'			
7/01/97	5467'	304'			
7/02/97	5771'	889'			
7/03/97	6660'	560'			
7/04/97	7220'	1055'			
7/05/97	8275'	818'			
7/06/97	9093'	31'			
TD	9124				

BIT RECORD

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #18-12 SE 1-A HORIZONTAL LATERAL LEG #1

RUN	SIZE	MAKE	TYPE	IN/OUT	FTG	HRS	FT/HR
#1(RR)	4 3/4"	HTC	STR-30	5377'/ 5562'	185'	18.0	10.3
#2	4 3/4"	HTC	STR-30	5562'/ 9124'	3562'	89.0	40.0

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer : Mobil
Platform : RATHERFORD UNIT
Slot/Well : BA2 5/18-12 1A1

MEASURE DEPTH	ANGLE DEG	DIRECTION DEG	TVD DEG	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
5200	0.37	190.29	5198.47	0.16 S	48.55 W	-41.97	0
5368	0.36	192.46	5366.46	1.41 S	48.37 W	-41.18	0
5377	3.6	108.78	5375.45	1.52 S	48.08 W	-40.88	36.74
5387	3.6	107.44	5385.00	1.85 S	47.08 W	-39.05	48.02
5397	13.7	107.01	5395.2	2.42 S	45.24 W	-37.97	52.01
5407	19.6	106.70	5404.81	3.22 S	42.59 W	-35.77	48
5417	23.6	106.65	5414.14	4.23 S	39.16 W	-31.70	50
5427	26.9	106.36	5423.11	5.51 S	34.95 W	-27.45	54
5437	33.9	106.5	5431.64	6.99 S	29.93 W	-22.43	50
5447	38.7	107.7	5439.7	8.74 S	24.08 W	-16.86	48.52
5457	43.9	108.2	5447.21	10.77 S	18 W	-10.12	52.1
5467	48.4	109.5	5454.14	13.1 S	11.15 W	-3.13	45.96
5477	52.4	107.7	5460.44	15.57 S	3.93 W	4.47	51.01
5487	57.4	109.2	5466.12	18.15 S	3.08 E	12.54	47.00
5497	60.6	111.1	5471.25	21.14 S	12.03 E	20.99	37.7
5507	65.2	109.4	5475.79	24.22 S	20.39 E	29.77	46.53
5517	69.3	108.3	5479.33	27.2 S	29.13 E	38.23	47.11
5527	72.3	107.4	5482.7	30.12 S	38.10 E	46.10	45.01
5537	79.2	106.6	5484.99	32.96 S	47.49 E	54.81	49.61
5547	83.7	109.8	5486.48	36.05 S	56.88 E	67.28	55.01
5552	87.9	110.4	5487.33	41.19 S	70.02 E	82.02	28.20
5562.3	90	112.2	5488.5	59.46 S	117.78 E	131.73	5.5
5644.18	89.8	114.6	5488.55	72.13 S	147.03 E	163.39	7.55
5675.05	89.5	116.5	5488.75	85.32 S	175.60 E	195.03	8.05
5707.37	90.2	118.7	5488.80	100.51 S	203.8 E	220.75	7.20
5739.37	90.4	120.6	5488.67	116.19 S	231.35 E	258.45	6.03
5771.18	89.9	121.3	5488.06	132.64 S	258.61 E	290.24	5.21
5802.13	90	121.4	5489.10	148.72 S	293.17 E	321.02	3.55
5834.09	90.8	121.4	5488.94	165.3 S	312.34 E	353.14	2.51
5865.05	90.4	121.3	5488.61	181.41 S	339.79 E	384.09	1.33
5896.02	90.5	121.6	5489.36	198.04 S	365.96 E	415.95	0.99
5926.01	90.5	122.1	5488.09	214.44 S	392.37 E	447.63	1.31
5959.78	91.5	122.1	5487.54	231.32 S	419.28 E	473.77	3.15
5991.57	90.6	121.8	5486.95	248.14 S	446.25 E	510.53	2.96
6023.33	90.6	121.1	5487.13	264.71 S	473.34 E	542.23	6.67
6054.15	91.9	121.1	5486.12	280.34 S	499.92 E	573.51	2.20
6086.24	89.3	121.1	5489.3	297.2 S	527.19 E	605.16	4.39
6113.13	90.1	123.2	5489.07	314.10 S	554.18 E	637.02	7.00

MEASURE DEPTH	ANGLE DEG	DIRECTION DEG	TVD DEG	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
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6149.91	89.6	125.3	5489.15	392.06 S	680.45 E	689.71	6.79
6191.68	89.9	127.6	5489.29	350.92 S	606.01 E	700.28	7.3
6212.44	90.5	128.3	5489.18	370.45 S	631.05 E	731.73	2.9
6244.46	90.2	127.6	5488.99	389.55 S	655.53 E	762.48	2.45
6276.33	89.6	130.2	5489.05	409.54 S	680.31 E	793.94	8.38
6307.33	90.5	131.1	5489.02	429.74 S	703.83 E	824.4	4.11
6339.33	90.3	131.1	5489.66	450.61 S	727.75 E	855.56	3.94
6369.73	90.3	130.6	5488.36	470.69 S	750.9 E	885.65	1.9
6401.56	89.9	130.4	5488.31	491.41 S	775.07 E	916.93	1.78
6433.35	90.4	131.3	5488.23	512.2 S	799.12 E	948.15	3.24
6465.2	91.1	132	5487.81	533.36 S	822.91 E	979.34	3.11
6496.96	93.3	133.2	5486.59	554.84 S	846.27 E	1010.31	7.89
6528.66	92.4	133.4	5485.01	576.56 S	869.31 E	1041.13	2.91
6560.47	92.7	132.2	5483.6	598.35 S	892.44 E	1072.05	1.13
6592.12	90.5	131.3	5482.71	619.62 S	915.86 E	1102.97	9.18
6623.85	90.4	130.4	5482.47	640.37 S	939.86 E	1134.13	2.85
6655.7	90.5	129.9	5482.22	660.91 S	964.2 E	1165.48	1.6
6687.32	92.2	129.9	5481.47	681.31 S	963.6 E	1196.61	5.34
6719.4	92.4	130.1	5480.19	701.79 S	1013.01 E	1228.18	0.89
6751.05	93.6	129	5479.58	721.94 S	1037.4 E	1259.39	8.92
6782.66	93.6	128.8	5479.66	741.81 S	1062.03 E	1290.65	0.71
6814.36	90.4	129	5479.58	761.69 S	1086.67 E	1321.93	1.7
6846.19	90.3	129.4	5479.38	781.81 S	1111.34 E	1353.35	1.3
6877.36	90.2	129.5	5479.25	802 S	1135.87 E	1384.69	0.45
6908.71	91.1	129.9	5478.69	822.28 S	1160.3 E	1415.99	3.1
6940.7	90.4	129.7	5478.48	842.11 S	1184.11 E	1446.52	2.35
6972.52	90.5	130.2	5478.23	862.54 S	1208.5 E	1477.86	1.6
7004.3	90.9	132.2	5477.84	883.47 S	1232.41 E	1509.03	3.42
7036.01	90.4	131.5	5477.48	904.63 S	1256.03 E	1540.06	2.71
7067.91	90.4	131.3	5477.27	925.13 S	1279.28 E	1570.45	0.65
7110.51	88.4	130.3	5477.75	955.9 S	1314.4 E	1616.1	4.53
7145.37	87.4	130.2	5478.92	976.24 S	1336.64 E	1647.42	3.38
7176.33	87.8	130.2	5480.22	996.2 S	1362.27 E	1677.86	1.29
7208.15	89.4	129.3	5481.27	1016.67 S	1386.61 E	1709.17	2.11
7239.91	88.6	129.7	5482.05	1036.99 S	1411.01 E	1740.46	1.41
7271.63	89.1	129.4	5482.63	1057.18 S	1435.46 E	1771.74	1.34
7303.28	89	128.6	5483.15	1077.16 S	1460.13 E	1803.09	2.54
7335.13	88.6	128.5	5483.74	1096.94 S	1484.36 E	1834.48	0.45
7366.97	88.9	128.3	5484.35	1116.72 S	1509.9 E	1865.96	0.63
7398.79	89	129.9	5484.93	1136.78 S	1534.59 E	1897.39	5.04
7430.59	88.4	129.9	5485.65	1157.17 S	1558.98 E	1928.7	1.99
7462.25	89	132	5486.37	1177.92 S	1582.89 E	1959.78	6.69
7494.09	91.1	133.9	5486.34	1199.61 S	1606.19 E	1990.81	8.89
7526.24	91.1	136.6	5483.18	1292 S	1691.96 E	2111.28	1.27
7558.73	91	133.3	5482.02	1339.62 S	1734.02 E	2171.52	0.8
7591.45	91.5	136.5	5480.57	1387.22 S	1776.27 E	2231.91	0.99

MEASURE	ANGLE	DIRECTION	TVD	NORTHING	GS	EASTING	GS	VERTICAL	DOG
DEPTH	DEG	DEG		FEET		FEET		SECTION	LEG

7623.33	88.4	137.6	5482.12	1461.37 S		1861.27 E		2352.6	0.45
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7000	30.0	137.1	5400.20	1520.19 S	100.14 E	2410.00	2.04
8001.00	39.5	138.4	5463.73	1574.06 S	1946.02 E	2474.32	1.11
8065.31	39.5	138.5	5484.29	1621.45 S	1991.06 E	2535.03	3.3
8123.75	30.5	143.2	5484.20	1670.63 S	2031.1 E	2594.3	7.57
8192.43	39.7	144.6	5484.18	1722.03 S	2068.62 E	2652.52	2.53
8255.00	38.7	144.5	5485.07	1771.4 S	2105.02 E	2710.00	1.58
8319.53	38.6	143.6	5486.56	1825.08 S	2142.77 E	2768.23	1.43
8382.51	38.2	142.9	5487.09	1875.74 S	2180.48 E	2826.2	1.13
8446.12	30.6	143.4	5488.32	1926.62 S	2218.59 E	2884.67	2.94
8509.71	31.7	143.8	5487.05	1977.8 S	2256.32 E	2942.03	1.84
8573.21	31.6	143.1	5485.22	2028.79 S	2294.12 E	3001.16	1.11
8636.02	30.7	140.4	5403.94	2079.74 S	2332.17 E	3059.59	1.49
8700.43	31.9	142.7	5482.5	2130.56 S	2370.4 E	3118.1	2.18
8763.85	32.1	142.2	5480.29	2180.81 S	2409.02 E	3176.68	0.85
8827.33	30.4	142.2	5473.0	2231.18 S	2448.07 E	3235.37	2.37
8891.21	30.7	141.7	5476.25	2281.26 S	2487.29 E	3294.59	0.92
8954.95	32.4	141.7	5476.56	2331.26 S	2526.73 E	3353.30	2.67
9018.53	32.2	141.3	5473.68	2380.97 S	2566.32 E	3412.63	3.25
9082.01	33.9	141.5	5472.39	2430.33 S	2612.15 E	3481.67	
9124	33.9	141.5	5473.2	2483.41 S	2632.06 E	3511.13	5.31

0

THE DOGLEG SEVERITY IS IN DEGREES PER 100.0 FEET
 N/E COORDINATE VALUES GIVEN RELATIVE TO WELL HEAD
 TVD COORDINATE VALUES GIVEN RELATIVE TO WELL HEAD
 THE VERTICAL SECTION ORIGIN IS WELL HEAD.
 THE VERTICAL SECTION WAS COMPUTED ALONG 120.00 (TRUE).
 CALCULATION METHOD: MINIMUM CURVATURE

MUD REPORT

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #18-12 SE 1-A HORIZONTAL LATERAL LEG #1

DATE	DEPTH	WT	VIS	PLS	YLD	GEL	pH	WL	CK	CHL	CA	SD	OIL	WTR
6/27/97	RIG DOWN	MOVE RIG												
6/28/97	0'	-	-	-	-	-	-	-	-	-	-	-	-	-
6/29/97	5369'	8.8	26	-	-	-	10.5	NC	NC	40000	800	-	TR	100%
6/30/97	5377'	8.8	26	-	-	0/0	11.6	NC	NC	43000	480	-	0%	100%
7/01/97	5556'	8.8	28	2	1	0/0	11.8	NC	NC	65000	480	-	0%	100%
7/02/97	6056'	8.8	28	2	1	0/0	11.7	28	NC	66000	400	-	3%	97%
7/03/97	6989'	8.8	28	2	1	0/0	11.8	28.6	NC	60000	800	-	4%	96%
7/04/97	7251'	8.8	29	2	1	0/0	11.8	40.2	NC	60000	800	-	4%	96%
7/05/97	8619'	8.8	28	2	1	0/0	11.6	40	NC	65000	800	-	3%	97%
7/06/97	9124'	8.9	29	1	2	0/0	11.0	NC	NC	71000	600	-	6%	94%

FORMATION TOPS

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #18-12 SE 1-A HORIZONTAL LATERAL LEG #1

FORMATION NAME		SAMPLES MEASURED DEPTH	SAMPLES TRUE VERTICAL DEPTH	DATUM KB:4687'
LOWER ISMAY		5423'	5419'	-732'
GOTHIC SHALE		5474'	5458'	-771'
DESERT CREEK		5495'	5470'	-783'
DC 1-A		5514'	5478'	-791'

GEOLOGICAL SUMMARY

AND

ZONES OF INTEREST

The Mobil Exploration and Production U.S. Inc., Ratherford Unit #18-12 Horizontal Lateral Leg 1 was a re-entry of the Mobil Ratherford Unit #18-12 located in Section 18, T41S, R23E, and was sidetracked in a southeasterly direction from a 5377' measured depth, 5377' true vertical depth, on June 29, 1997. The lateral reached a measured depth of 9124', true vertical depth of 5473' at total depth, with a horizontal displacement of 3511' and true vertical plane 141.5 degrees, on July 6, 1997, in the upper Desert Creek 1-A porosity zone, where the decision to terminate the lateral was made. The lateral was drilled with only minor problems, which were minor traces of H₂S gas noted while milling the window and up to 30 ppm at 7099', which was due to the well having been used for injection prior to the lateral being drilled and the water flow encountered also at 7099' as the lateral passing with in 216' of the R.U. # 18-23 injection well. At a measured depth of 7099', the lateral was temperately halted due to the above mentioned water flow. The well was shut in with up to 650 psi on the casing. The decision was made to continue the lateral and a trip was made to pick up more drill pipe to continue the lateral. This lateral used fresh water and then oil and water emulation with polymer sweeps as the drilling fluid. A very minor amount of oil was noted while drilling the lateral through the 1-A porosity zone. The background gases noted on the accompanying mud log showed moderate to good increases while drilling the 1-A porosity, and decreased from a measured depth of 7099' to termination. The samples showed a fair amount of oil shows through out the drilling of the lateral in the 1-A section.

The primary objectives of the Ratherford Unit #18-21 Leg 1 horizontal lateral was the upper 1-A porosity bench of the Desert Creek, to identify and define the porosity benches, the effective porosity, staining and reservoir properties in 1-A zone of the Desert Creek Member of the Upper Paradox Formation. The Upper Ismay, Lower Ismay, Gothic Shale, and the transition zone at the top of the Desert Creek were encountered while drilling the curve section of the lateral. Kick off point for this lateral was 5377', measured and true vertical depth, in the middle to lower 1/3 of the Upper Ismay member of the Paradox Formation.

The top of the Upper Ismay was not seen during the drilling of the R.U. 18-21 reentry. The Upper Ismay was predominately light gray to gray brown to medium brown, microcrystalline to cryptocrystalline, some very fine crystalline, chalky to clean, slightly argillaceous, cherty, occasionally fossiliferous limestone. There were very thin interbedded dark gray brown to black, carbonaceous, slightly calcareous to dolomitic shales, and scattered brown to black to translucent chert fragments noted through out the Upper Ismay. There was no visible porosity noted in the Upper Ismay, with only a few zones of poor intercrystalline porosity with very rare visible mineral fluorescence and no stain or cut and no significant gas increases. The very dolomitic limestones at the base of the Upper Ismay graded into the very thin, carbonaceous, dolomitic shale of the Hovenweep.

The top of the Lower Ismay was picked at 5423' measured depth, 5419' true vertical depth, at the base of the very thin Hovenweep shale. The Lower Ismay was predominately a cream to white, tan to dark brown limestone, microcrystalline to cryptocrystalline, very rarely granular, silty to sandy, some clean, cherty with a trace of scattered micro fossils. Through out the Lower Ismay were significant amounts of silty and sandy limestone grading to very limy siltstone and very fine to fine grained, light gray to translucent, very limy sandstone, which graded to very sandy limestone. These calcareous to slightly siliceous silts and sands indicated possible slumping feature during the deposition of the Lower Ismay. No visible porosity, with only very poor mineral fluorescence, and no

stain or cut was seen in the limestones in the Lower Ismay. Interbedded in the limestones were rare and very thin scattered dark brown dolomites, which were cryptocrystalline to microcrystalline, earthy to clean, with no visible porosity, fluorescence, stain or cut. The dolomitic limestones and very thin dolomites at the base of the Lower Ismay became gray brown, very argillaceous and shaley. These basal limestones and dolomites also became very marly and graded into the Gothic Shale.

The top of the Gothic Shale was at 5474' measured depth, 5458' true vertical depth. The Gothic Shale was predominantly dark gray to black, silty, carbonaceous, brittle to firm, subblocky to blocky to platy, calcareous to slightly dolomitic and slightly micaceous. The top of the Gothic was gradational from the very thin interbedding of very argillaceous, carbonaceous limestone and very argillaceous, limy dolomite, with the dolomite grading into very dolomitic, carbonaceous shale. The top of the Gothic was picked predominantly by the decrease in penetration rate and a distinct increase in the percentage of shale in the samples.

Between the Gothic Shale and Desert Creek Porosity Members is a transitional zone, which appears to be upwardly gradational. The top of the Desert Creek is commonly picked at the Gothic Shale to transition zone facies change, which in this leg occurred at a measured depth of 5495' and a true vertical depth of 5470'. In this well the zone was interbedded a very silty, dolomitic limestone, brown, limy, argillaceous dolomites and very thin carbonaceous shales. The limestones were cream to tan, some gray to white to brown to dark brown, cryptocrystalline to microcrystalline, argillaceous, and anhydritic, with scattered anhydrite crystals. The limestones had no visible to very rare, very poor intercrystalline porosity, but only very rare, spotty mineral fluorescence and no visible stain or cut. The interbedded dolomites were microcrystalline to granular, slightly silty and had no to very rare intercrystalline porosity, with no visible sample show. The limestones graded into the oolitic porosity of the 1-A zone.

The top of the Desert Creek 1-A porosity zone was picked at 5514' measured depth, 5478' true vertical depth, with a horizontal displacement of 35'. The pick was based on sample identification as well as a significant increase in the penetration rate. The top in this lateral was in a very oolitic, clean to very slightly dolomitic, slightly anhydritic limestone grainstone, which had very rare scattered chert fragments. Noted in the limestone were thinly interbedded tight, cryptocrystalline, occasionally platy, anhydritic to very slightly dolomitic limestone packstones near the top. The limestone was cream to tan, light brown to occasionally brown, with predominately fair to good intercrystalline to oolitic porosity, some very rare algal porosity. It appears that the 1-A porosity bench is possibly defined by the interval 5478' true vertical depth to approximately 5491' true vertical depth. The top of the porosity bench was marked by a slightly gradational to sharp facies change as the drill rate increased rather rapidly. The base of the porosity zone was not encountered until drilling the lateral section.

The curve was landed in the lower 1/4 of the 1-A porosity zone. At a measured depth of 5562', 5487' true vertical depth, with a horizontal displacement of 82' a trip was made to change the bit and the bottom hole assembly to the lateral assembly. The limestones in this upper bench became increasingly granular and oolitic with an increase in stain, fluorescence and cut. Upon resumption of drilling in the lateral section, the well bore was drilled at a very slight upward angle to move away from the projected base of the porosity zone of the 1-A and then oriented approximately flat.

The oolitic limestone porosity of the 1-A zone was continuous through the length of the lateral, from a measured depth of 5514', 5478' true vertical depth, to its termination at a measured depth of 9124', 5473' true vertical depth, with 3511' of horizontal displacement. These limestones were tan to light brown to brown, microcrystalline to very finely crystalline, very oolitic to slightly oolmoldic, occasionally very slightly algal. Through out the zone there were varying amounts of dolomite cement, translucent to buff chert fragments and anhydrite crystals to inclusions. Scattered anhydrite filled porosities was also noted. As the well bore approached the top and base of the zone an increase in tight, tan to cream to white, cryptocrystalline, very slightly oolmoldic limestone packstone,

with a slight increase in scattered chert fragments, and decreasing porosity, stain, fluorescence and cut was noted. A hard streak was encountered at a measured depth of 5970', 5487' true vertical depth and a horizontal displacement of 490', at which time the well bore, was forced downward. The top of the 1-A zone porosity zone was tagged at measured depths of 6724', 7085', 7751', and 8224', true vertical depths of 5480', 5476', 5480', 5484.5', with horizontal displacements of 1235', 1588', 2240', and 2684' respectively. The top of the 1-A porosity zone was very shallowly penetrated from measured depth of 9010' to 9060', with a true vertical depth of 5474' and horizontal displacements from 3400' to 3457'. The base of the best porosity was encountered through this interval at measured depths of 6474', 7470', 8405, with true vertical depths of 5487', 5486', 5488' and had horizontal displacements of 990', 1968', and 2848' respectively. In each case a slight decrease in the oolitic and intercrystalline porosity was noted, as well as an increase in white to cream, occasionally platy limestone packstone.

As the well bore bumped along the base of the 1-A porosity zone, across a measured depth interval from 6100' to 6480', 5489' to 5487' true vertical depths, with horizontal displacements of 620' to 990', the lateral encountered very thin, platy, dense, limestone packstone, with vary amounts of white to milky, slightly oolitic chert fragments. The porosity, stain and cut showed a slight decrease over this interval.

The lateral was flat from a horizontal of 38' to 1600', from 1600' to 2700' the dip was at approximately an 89.4 degree down and from 2700' to 3511' (total depth) the dip angle was upward at approximately 90.8 degrees.

From a measured depth of 6960' measured depth, 5478' true vertical depth, with 1470' of horizontal displacement, as the well bore came in close proximity to the R.U. #18-23 well, a decrease in the sample show with in the good oolitic limestone grainstone was noted as well as a significant water flow. At a measured depth of 7099' as the well path came with in 216' of the #18-23 well, the well had to be shut in due to the water flow have in 650 psi of casing pressure at the R.U. #18-12 location. At this measured depth of 7099', 5477' true vertical depth, with a horizontal displacement of 1602', a trip was made up in to the casing initially to terminate the lateral and bleed off the pressure and injected water from the #18-23 well, but after the decision was made to continue drilling more tubing was picked up and the lateral continued. As the lateral was continued, the lithology remained a light brown to tan, cream to white, microcrystalline to very finely crystalline, limestone grainstone with rare scattered cryptocrystalline to platy, very thin, tight limestone packstone. The limestone were still very slightly dolomitic to having rare scattered dolomite rich cement, were very slightly anhydritic. There remained rare scattered translucent to clear chert fragments and translucent to light gray, anhydrite crystals and inclusions noted in the limestone porosity. The limestone grainstones had fair to good intercrystalline to oolitic porosity, with only a trace to fair fluorescence, stain and cut. The platy limestone packstones as the well bumped the top of the porosity zone were very tight and had no visible fluorescence, stain or cut. The background gases showed a marked decrease after encountering the water flow, which only slightly increased near the end of the lateral.

At a measured depth of 9010' to a measured depth of 9060', 5473' true vertical depth, and a horizontal displacement of 3451', the top of the porosity in the 1-A zone was very shallowly encountered. The lithology through this interval was predominately the tan to white, cryptocrystalline to microcrystalline, platy, dense limestone packstone with very thin oolitic limestone grainstone. This limestone packstones had a very slight increase in chert fragments and anhydrite crystals to inclusions, and a decrease in sample shows. As the well bore turned away from the top of the porosity zone the lithology returned to the very good oolitic limestone grainstones, with a slight increase in the sample show. Of note was just prior to bumping the top of the porosity was a gradual decrease in the background gases. The rate of penetration while rotating began decreasing as the top was encountered and began increasing as the well bore was slid downward and the decision was made at this point to attempt to slide the well bore to completion.

After reacquiring the top of the 1-A porosity zone, the well bore was continue to a total measured depth of 9124', 5472.5' true vertical depth, and a horizontal displacement of 3511', the decision was made to terminate the lateral, on July 6, 1997. The well bore was beyond any proposed horizontal displacement at this time, as the well was originally planed to go 1550' of horizontal displacement.

In tracking the well bore through the 1-A bench, the oolitic limestone grainstone porosity was very good and was consistent through out its length, although the porosity showed a minor amount of thinning from approximately 2400' of horizontal displacement. The porosity maintained an average thickness of 10', with a maximum thickness of 13' and an approximate minimum of 7'. In tracking the lateral through out it's length, the 1-A top was flat with the original well bore until reaching a horizontal displacement of 1600' and trended slightly downward until 2700' and then upward again toward the R.U. #18-23 well.

Predominant facies changes were associated with the vertical changes with in the limestones, with no noticeable lateral changes, as the environment of deposition changed when encountering the top or base of the 1-A zone. With the classification changes, the oolitic to very slightly algal limestones encountered were of varying thickness and were continuous through the 1-A zone penetrated. The effective or the better porosity was associated with the oolitic, to very slightly algal limestone grainstone facies which had fair to good, intercrystalline to oolitic and occasionally algal porosities, and the absence of any major anhydrite plugging. The limestone packstone at the top and base of the 1-A zone had no visible porosity and no to very poor permeabilities.

From the top of the 1-A porosity bench to a measured depth of 9124', the limestone lithology was consistent, ranging from light brown to medium brown, cryptocrystalline to very finely crystalline, occasionally microsucrosic to granular, with thin platy limestone packstone and scattered chert fragments, with increases in chert and the limestone packstones as the well bore bumped the top of the 1-A, and approached the 1-A to 1-B transition zone below the 1-A porosity. The limestones had fair to good intercrystalline to oolitic and a slight trace of algal porosity, predominately fair dull to bright yellow fluorescence, with noticeable decreases when at the top and of the zone, as well over the last 200' of the lateral. The staining in the limestones ranged from a trace to good light brown to dark brown, and scattered traces of black dead oil stain and the associated cuts being a predominately fair moderately fast to fast streaming cuts, with fair slow cut noted and increased after encountering the flushed zone and water flow near and beyond the #18-23 well. The very thin platy limestones at the top and the base of the 1-A porosity in this lateral had no visible porosity, fluorescence, staining, or cut. The sample shows were affected in part due to the oil & water emulsion used as the drilling fluid beginning at about 5800' in the lateral section and the water flow encountered at approximately 6960'.

The conclusion drawn from the northwesterly lateral in the 1-A zone is that in this area the limestone porosities were consistent through the zone. Also having an effect on the porosity, was the minor amounts of anhydrite filled porosity and the very thin, platy limestone packstones near the top and base of the 1-A zone. Staining was good to fair and there were sections where staining was poor to a trace, with some black dead oil staining trapped in the intercrystalline porosity. The lateral used the proposed target line as a reference point through the 1-A bench until reaching 1550', with the well bore following the best porosity through out the length of the 1-A porosity bench penetrated and the being turned toward the south to bypass the R.U. #18-23 well and continue toward the R.U. #18-34 well after 600' of the lateral had been drilled.

While drilling the lateral, the background gas was influenced by the minor amounts of oil encountered while drilling the lateral as well as the minor amounts of oil added to the mud system. A drop in the background gases was noted in the 1-A zone beginning at measured depth of 6960'. This lateral can be interpreted to having very good reservoir qualities through out. It appears that the porosities are well enough developed, in this northwesterly direction to enhance the overall performance of the zone.

*The black residual staining has been called by Dr. Dave Eby & others as "bitchimum" and is also known as "dead oil" ("dd o str" on mud logs). This staining is associated with the movement of oil over long periods of time and is a good indicator of producible hydrocarbons when associated with productive porosities, but can also be found in porosities that have been filled by anhydrites and other material at later dates.

SAMPLE DESCRIPTIONS

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #18-21 NW 1-A/1-B HORIZONTAL LATERAL

DEPTH	LITHOLOGY
5380.00 5390.00	"LS ltgy,lt-mbrn,lt-mgybrn,crpxl-micxl,occ vfxl,chk-sl arg,cln-occ mot/dkbrn-brnblk slty-shy strk,tr tan CHT frag,dns,tt-vrr frac POR,n-vrr dull orng FLOR,NSOC "
5390.00 5400.00	"SH dkbrn-brnblk-occ blk,sbblky-sbplty,frm-mod hd,slty-v slty ip,tr intbd LS incl,sl calc-dol ip,occ grdg to arg DOL,v sl sooty"
5400.00 5420.00	"LS m-dkgybrn,ltgybrn,ltgy,occ ltbrn,micxl-crpxl,rthy-slty,incr mot/SH AA,sl-occ v chky,tr GAST & mic fos,tr tan-dkbrn CHT frag,vrr ANHY frac fl,NFSOC"
5420.00 5430.00	"LS wh-tan,brn-dkbrn,crpxl-micxl,slty-v slty ip,anhy,occ chk,dns,tt,grdg to v lmy SLTST,v thn brn micxl arg lmy DOL incl,rr sl calc-dol ip,occ grdg to arg DOL,v sl sooty SH lams,v rr trnsd CHT frag & xln ANHY include"
5430.00 5440.00	"LS crm-tan-dkbrn,crpxl,occ micxl,chk,anhy,w/thn intbd SS ltgy,trnsd-wh,occ mgy,vf-f gr,rd-sbrd,w srt,w cmt/sil-sl calc cmt,tr pp mica incl,v sl arg ip,tr scat mlky-trnsd QTZ-sil nod,tt,NFSOC,occ grdg to v sdy ltgybrn lmy SLTST"
5440.00 5460.00	"SS ltgy-gybrn,trnsd-wh,occ ltbrn,vf-occ f gr,rd-sbrd,w srt,w cmt/sl calc-sil cmt,tr pp LS incl,tr scat QTZ nod,pred cln-tr arg fl,tt,dns,NFSOC,w/scat LS AA,tt,NFSOC"
5460.00 5470.00	"LS m-dkgybrn,ltgybrn,ltgy,occ ltbrn,micxl-crpxl,dns,rthy-sl slty,occ mot/dkbrn-brnblk SH,sl chky,tr trsl-mlky CHT frag,tt,NFSOC"
5470.00 5480.00	"SH blk-dkbrn-brnblk,sbblky-sbplty-irreg,sft-mod frm,carb,occ sl calc,rr pp mica,sooty"
5480.00 5500.00	"SH blk-dkbrn-dkgybrn,sbblky-sbplty,sft-frm,carb,mica,dol-calc,v sl slty-slty,w/tan-brn crpxl v arg tt LS & dkbrn-brn crpxl arg lmy DOL incl,v scat trnsd-wh ANHY xl"
5500.00 5510.00	"LS wh-crm-brn,occ dkbrn-dkgybrn,crpxl,micxl ip,cln-dns,chk ip,v sl slty,occ anhy-ANHY xl,dns,tt,w/intbd m-dkbrn-brn micxl-crpxl,dns,lmy-arg tt DOL & v thn carb SH stks & v rr trnsd CHT frag"
5510.00 5520.00	"LS tan-brn,crm,crpxl-vfxl,dns-gran,micsuc ip,occ DOL rich cmt & v thn dns DOL frag,sl anhy,v rr CHT frag,oolicastic-v sl alg,tt-fr intxl-tr ool-arg POR,fr dull-bri yel FLOR,tr-fr ltbrn STN-v rr blk dd o STN,fr-g slow-mod fast stmg CUT"
5520.00 5540.00	"LS wh-crm-brn,micxl-vfxl,occ crpxl,gran-micsuc,oolicastic-v sl alg,tr DOL rich cmt,pred LS GRNST,v rr LS PKST,rr ANHY fl POR,fr intxl-ool-v rr alg POR,fr bri-tr dull yel FLOR,fr lt-dkbrn STN,tr spty blk dd o STN,fr mod fast-fast stmg CUT"
5540.00 5550.00	"LS AA,scat ANHY xl-incl,tr ANHY fl POR,fr-g intxl-ool-rr alg POR,fr-g bri-dull yel FLOR,STN & CUT AA"

DEPTH	LITHOLOGY
5540.00 5550.00	"LS AA,scat ANHY xl-incl,tr ANHY fl POR,fr-g intxl-ool-rr alg POR,fr-g bri-dull yel FLOR,STN & CUT AA"
5550.00 5562.00	"LS AA,pred oolitic-v sl alg LS GRNST,n-v rr wh-crm LS PKST,fr-g intxl-ool-rr alg POR,fr-g bri-dull yel FLOR,fr ltbrn-brn STN,tr blk dd o STN,fr-g mod fast-fast strng CUT"
5562.00 5580.00	"LS tan-ltbrn,crm,occ brn,ooliclastic-vfxl,crpxl-gran,occ GRNST/tr trnsf xln ANHY incl,tr mic fos/rr COR fos,tr bf-crm CHT incl-frag,sl chky,g ooc-intxl POR,g even mod bri-bri yel FLOR,g-fr ltbrn/occ spty brn STN,tr pp blk dd o STN,g dif/tr slow strng CUT"
5580.00 5600.00	"LS AA,incr ltbrn-brn,ooliclastic GRNST LS,tr scat crpxl dns PCKST,occ chky prtgs/rr fl,v sl dol cmt,tr intbd CHT AA,tr mic fos,rr-tr xln ANHY incl-frag,g ooc-tr intxl POR,g even mod bri-bri yel FLOR,g mod fast strng CUT"
5600.00 5630.00	"LS ltbrn-brn,tan,occ crm,ooliclastic-vfxl-gran,occ GRNST/dol cmt,tr mic fos/vrr CRIN,tr bf-crm CHT incl,rr ANHY AA,g ooc POR/tr chky fl,g even mod bri-bri yel FLOR,g brn-ltbrn STN,tr scat pp blk dd o STN,g slow strng milky CUT"
5630.00 5650.00	"LS brn,occ ltbrn,crm,ooliclastic,vfxl-gran,occ crpxl,occ GRNST/tr intbd crpxl dns PCKST,occ dol cmt,sl chky/tr chk POR fl,tr mic fos,rr scat bf-tan CHT frag,g ooc POR,g even bri-mod bri yel FLOR,g brn-ltbrn STN/occ blk pp dd o STN,g slow strng milky CUT"
5650.00 5670.00	"LS brn,ltbrn,occ tan,crm,ooliclastic-vfxl-gran,occ crpxl,occ GRNST/tr dns crpxl PCKST incl,tr dol cmt,tr mic fos,tr bf-crm CHT incl,rr ANHY,g ooc POR/tr chky fl,g even mod bri-bri yel FLOR,g brn-ltbrn STN,tr scat pp blk dd o STN,g slow strng milky CUT"
5670.00 5700.00	"LS AA,ooliclastic GRNST LS,tr-rr agl mat,tr crpxl PCKST frag-incl,occ chky prtgs/tr POR fl,v sl dol cmt,tr tan-bf CHT incl,tr mic fos,rr-tr xln ANHY incl-frag,g ooc-tr agl-intxl POR,g even mod bri-bri yel FLOR,g STN AA,g mod fast strng milky CUT"
5700.00 5720.00	"LS brn,ltbrn,occ tan,crm,ooliclastic-vfxl-gran,occ crpxl,occ GRNST/sl dol cmt,tr scat PCKST,tr mic-rr CRIN fos,rr bf-crm CHT incl,vrr ANHY,g ooc POR/rr chky fl,g even mod bri-bri yel FLOR,g brn-ltbrn STN,tr scat pp blk dd o STN,g slow strng milky CUT"
5720.00 5730.00	"LS AA,ooliclastic GRNST LS/tr crpxl PCKST frag-incl,rr chky prtgs-POR fl,v sl dol cmt,tr tan-bf CHT incl,tr mic fos,rr-tr xln ANHY incl-frag,g ooc-tr intxl POR,g even mod bri-bri yel FLOR,g brn-ltbrn STN/incr scat blk dd o STN,g mod fast strng milky CUT"
5730.00 5750.00	"LS AA,ooliclastic GRNST/tr agl mat,tr scat PCKST frag-incl,tr dol cmt,sl chky-rr chky prtgs,occ chk fl POR,tr mic fos,rr CHT incl,vrr ANHY,g ooc-tr agl POR,g evenbri-mod bri yel FLOR,g brn STN/occ scat blk dd o STN,g slow strng-blooming milky CUT "
5750.00 5780.00	"LS ltbrn-brn,tan,occ crm,ooliclastic-vfxl-gran,occ crpxl,occ GRNST/tr dol cmt,tr scat crpxl PCKST frag,tr mic fos,tr bf-crm CHT incl,rr ANHY,g ooc-rr agl POR/rr chky fl,g even bri-mod bri yel FLOR,g brn-ltbrn STN,tr scat blk STN,g slow strng milky CUT"
5780.00 5800.00	"LS ltbrn-brn,tan,occ crm,ooliclastic-vfxl-gran,sl agl,occ GRNST/dol cmt,v sl chky,decr PCKST,tr mic fos,tr bf-crm-trnsf CHT incl,vrr ANHY,g ooc-tr agl POR,g even mod bri-bri yel FLOR,g brn-ltbrn STN,tr scat pp blk dd o STN,g slow strng milky CUT"

DEPTH	LITHOLOGY
5800.00 5820.00	"LS AA, tr agl, ooliticlastic GRNST LS/tr crpxl PCKST frag-incl, rr-tr chky prtgs/POR fl, sl dol cmt, tr CHT incl, tr mic fos, rr xln ANHY frag, g ooc-tr agl POR, g even mod bri-bri yel FLOR, g brn-ltbrn STN/tr scat blk dd o STN, g mod fast strmg mlky CUT"
5820.00 5840.00	"LS ltbrn-brn, tan, occ crm, ooliticlastic-vfxl-gran-agl, occ crpxl, ooc GRNST/tr dol cmt, sl chk, tr scat crpxl PCKST frag, tr mic fos, tr CHT incl, rr ANHY, g ooc-rr agl POR/rr chky fl, g even bri-mod bri yel FLOR, g brn-ltbrn STN, tr scat blk STN, g slow strmg mlky CUT"
5840.00 5880.00	"LS brn-ltbrn, crm-tan, micxl-vfxl, rr crpxl, gran-micsuc, ooliticlastic, rr alg mat, sl dol, rr ANHY xl-v rr CHT frag, pred LS GRNST, v rr scat LS PKST, rr Crin FOS, fr-g intxl-ool POR, fr-g dull-bri yel FLOR, fr brn-dkbrn STN, tr blk dd o STN, fr-g mod fast-fast stmg CUT"
5880.00 5890.00	"LS AA, pred ooliticlastic-v sl alg LS GRNST, scat ANHY xl, POR-FLOR-STN-CUT AA"
5890.00 5910.00	"LS ltbrn-brn, tan, occ crm, ooliticlastic-vfxl-gran-agl, ooc GRNST/tr dol cmt, tr scat crpxl PCKST frag, tr mic fos, rr CHT frag, rr ANHY xl, v rr Crin fos, g intxl-ool-rr agl POR, g bri-mod bri yel FLOR, g brn-ltbrn STN, tr blk dd o STN, g slow strmg mlky CUT"
5910.00 5940.00	"LS AA, pred ooliticlastic-v sl alg LS GRNST, tr tt dns LS PKST, scat ANHY xl-occ ANHY fl POR, POR-FLOR-STN-CUT AA"
5940.00 5960.00	"LS brn-ltbrn, crm-tan, micxl-vfxl, rr crpxl, gran-micsuc, ooliticlastic, rr alg mat, sl dol, rr ANHY xl-v rr ANHY fl POR, pred LS GRNST, tr LS PKST, rr Crin FOS, fr-g intxl-ool POR, fr-g dull-bri yel FLOR, fr brn-dkbrn STN, tr blk dd o STN, fr-g mod fast-fast stmg CUT"
5960.00 5980.00	"LS AA, sl incr tt-v sl ool LS PKST, POR-FLOR-STN-CUT AA"
5980.00 6000.00	"LS brn-ltbrn, crm-tan, micxl-vfxl, rr crpxl, gran-micsuc, ooliticlastic, rr alg mat, sl dol, rr ANHY xl, pred LS GRNST, v rr scat LS PKST, v rr Crin FOS, fr-g intxl-ool POR, fr-g dull-bri yel FLOR, fr brn-dkbrn STN, tr blk dd o STN, fr-g mod fast-fast stmg CUT"
6000.00 6010.00	"LS AA, sl incr LS PKST w/ANHY fl POR, fr-g intxl-ool-v rr alg POR, fr-g dull-bri yel FLOR, fr-g ltbrn-brn STN, tr blk dd o STN, g mod fast-fast stmg CUT"
6010.00 6030.00	"LS brn-ltbrn, crm-tan, micxl-vfxl, rr crpxl, gran-micsuc, ooliticlastic, rr alg mat, sl dol, rr ANHY xl, pred LS GRNST, rr-tr scat LS PKST, fr-g intxl-ool POR, fr-g dull-bri yel FLOR, fr brn-dkbrn STN, tr blk dd o STN, fr-g mod fast-fast stmg CUT"
6030.00 6050.00	"LS AA, sl incr tt-v sl ool LS PKST w/scat ANHY fl ool POR-ANHY incl-xl, v rr trnsd CHT frag, POR-FLOR-STN-CUT AA"
6050.00 6060.00	"LS pred ooliticlastic LS GRNST, n vis ALG mat, v rr trnsd CHT frag, v rr scat LS PKST, AA, POR-FLOR-STN-CUT AA"
6059.00 6080.00	"LS tan-brn-mbrn, occ crm, micxl-vfxl, crpxl ip, ooliticlastic, v sl anhy-v rr ANHY fl POR, v sl DOL cmt, pred ool LS GRNST, scat tr dns-tt v sl ool LS PKST, v rr CHT frag, fr-g intxl-ool POR, n vis alg POR, fr-g dull-bri yel FLOR, fr-g ltbrn-brn-rr blk STN, g fast CUT"
6080.00 6090.00	"LS AA, sl incr dns sl ool LS PKST w/ANHY fl POR, FLOR-STN-CUT AA"

DEPTH	LITHOLOGY
6090.00 6100.00	"LS AA,pred oolitic LS GRNST,w/n vis alg POR,thn intbd tt LS PKST w/ANHY fl POR,tt-g ool-fr intxl POR,fr-g dull-bri yel FLOR,fr ltbrn-brn STN-tr blk dd o STN,fr-g mod fast-fast stmg CUT"
6100.00 6120.00	"LS tan-brn-mbrn,occ crm,micxl-vfxl,crpxl ip,oolitic,v sl anhy-v rr ANHY fl POR,v sl DOL cmt,pred ool LS GRNST,scat tr dns-tt v sl ool LS PKST,fr-g ool-fr intxl POR,fr-g dull-bri yel FLOR,fr-g ltbrn-brn-tr blk STN,g mod fast-fast stmg CUT"
6120.00 6140.00	"LS tan-brn-mbrn,occ crm,rr wh-ltgy,crpxl-vfxl,gran-micsuc,pred oolitic LS GRNST,w/v thn v sl ool LS PKST incl,scat ANHY xl-incl,tr ANHY fl POR,n-v rr alg mat,v sl dol,fr-g ool-fr intxl POR,fr-g dull-bri yel FLOR,fr ltbrn-brn-rr blk STN,fr-g fast CUT"
6140.00 6150.00	"LS AA,v rr Crin fos,sl incr LS PKST,POR-FLOR-STN-CUT AA"
6150.00 6170.00	"LS AA,pred oolitic LS GRNST,thn intbd tt LS PKST w/ANHY fl POR,v rr scat trnsd CHT frag,tt-g ool-fr intxl POR,fr-g dull-bri yel FLOR,fr ltbrn-brn STN-tr blk dd o STN,fr-g mod fast-fast stmg CUT"
6170.00 6180.00	"LS pred oolitic LS GRNST,v rr trnsd CHT frag,rr tt v sl ool LS PKST,AA,POR-FLOR-STN-CUT AA"
6190.00 6210.00	"LS tan-brn-mbrn,occ crm,rr wh-ltgy,crpxl-vfxl,gran-micsuc,pred oolitic LS GRNST,w/v thn v sl ool LS PKST incl,scat ANHY xl-incl,tr ANHY fl POR,v rr CHT frag,v sl dol,fr-g ool-fr intxl POR,fr-g dull-bri yel FLOR,fr ltbrn-brn-rr blk STN,fr-g fast CUT"
6210.00 6220.00	"LS pred oolitic LS GRNST,v rr trnsd CHT frag,rr tt v sl ool LS PKST,AA,POR-FLOR-STN-CUT AA"
6220.00 6230.00	"LS AA,pred oolitic LS GRNST,v rr scat LS PKST incl,v rr CHT frag,rr scat Crin fos,POR-FLOR-STN-CUT AA"
6230.00 6250.00	"LS tan-brn-mbrn,occ crm,micxl-vfxl,crpxl ip,oolitic,v sl anhy-v rr ANHY fl POR,v sl DOL cmt,pred ool LS GRNST,scat tr dns-tt v sl ool LS PKST,v rr CHT frag,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr-g ltbrn-brn-rr blk STN,g fast CUT"
6250.00 6270.00	"LS AA,pred LS GRNST,w/v rr scat LS PKST incl,v rr CHT frag,scat ANHY xl-v rr intxl,g ool-fr intxl POR,fr-g dull-bri yel FLOR,fr ltbrn-brn STN,rr blk dd o STN,fr-g mod fast-fast stmg CUT"
6270.00 6280.00	"LS AA,incr dns sl ool LS PKST w/ANHY fl POR,FLOR-STN-CUT AA"
6280.00 6300.00	"LS tan-brn-mbrn,occ crm,rr wh-ltgy,crpxl-vfxl,gran-micsuc,pred oolitic LS GRNST,w/thn n-sl ool LS PKST incl,scat ANHY xl-incl,tr ANHY fl POR,rr ool CHT frag,v sl dol,fr-g ool-fr intxl POR,fr-g dull-bri yel FLOR,fr ltbrn-brn-rr blk STN,fr-g fast CUT"
6300.00 6320.00	"LS tan-brn-mbrn,wh-crm ip,crpxl-vfxl,gran-micsuc ip,oolitic,v sl anhy,pred LS GRNST,occ plty LS PKST,scat wh-trnsd v sl ool CHT frag,occ ANHY xl-POR fl,fr ool-intxl POR,fr-g dull-bri yel FLOR,rr brn STN,rr blk dd o STN,fr mod fast stmg CUT"
6320.00 6340.00	"LS tan-brn-mbrn,occ crm-wh,crpxl-vfxl,gran-micsuc,pred oolitic LS GRNST,w/thn plty LS PKST incl,scat ANHY xl-incl-tr fl POR,rr trnsd-wh CHT frag,v sl dol,fr-g ool-fr intxl POR,fr-g dull-bri yel FLOR,fr ltbrn-brn-rr blk STN,fr-g fast CUT"

DEPTH	LITHOLOGY
6340.00 6350.00	"LS AA,pred oolitic LS GRNST,thin intbd to platy wh LS PKST,occ ANHY fl POR,tr trns-l-wh CHT frag,tt-fr ool-intxl POR,fr-g dull-bri yel FLOR,fr ltbrn-brn STN-tr blk dd o STN,fr-g mod fast-fast strng CUT"
6350.00 6370.00	"LS tan-brn-mbrn,occ crm-wh,crpxl-vfxl,gran-micsuc,pred oolitic LS GRNST,w/thin platy LS PKST incl,scat ANHY xl-incl-tr fl POR,rr trns-l-wh CHT incl,v sl dol,fr-g ool-fr intxl POR,fr-g dull-bri yel FLOR,fr ltbrn-brn-rr blk STN,fr-g slow-mod fast strng CUT"
6370.00 6390.00	"LS tan-ltbrn,crm-wh,occ brn,vfxl-crpxl-gran,oolitic,micsuc,occ GRNST,v sl dol,scat platy chky-occ dns PCKST,tr crm-trns-l CHT incl-rr frag,rr trns-l xln ANHY,fr ool-intxl POR,g even mod bri-scat bri yel FLOR,g ltbrn-tr brn STN,rr blk pp dd o STN,CUT AA"
6390.00 6410.00	"LS AA,pred ool LS GRNST,sl dol,v sl anhy,incr scat dns crpxl/decr chky platy PCKST,chky/tr intxl POR fl,incr crm-bf-occ trns-l CHT frag-incl,rr trns-l xln ANHY frag,fr-g ool-tr intxl POR,g mod bri-bri yel FLOR,g ltbrn/tr scat brn STN,rr blk pp dd o STN,CUT AA"
6410.00 6430.00	"LS tan-ltbrn,occ crm-wh,brn,vfxl-gran-oolitic,crpxl-micsuc,occ GRNST,v sl dol,tr scat platy chky-dns PCKST,tr crm-trns-l CHT incl-rr frag,rr xln ANHY AA,fr ool-intxl POR,g even mod bri/scat bri yel FLOR,g ltbrn-tr brn STN,vrr blk pp dd o STN,CUT AA"
6430.00 6460.00	"LS AA,pred LS GRNST/incr crm-wh scat platy chky-arg PCKST & dns crpxl PCKST frag,incr crm-trns-l CHT incl-frag,rr trns-l xln ANHY frag,fr ool-intxl POR/tr chky fl,g even mod bri-scat bri yel FLOR,g ltbrn/tr brn STN,rr blk STN,g dif/tr slow strng CUT "
6460.00 6490.00	"LS AA,incr crm-wh,vfxl-gran-oolitic,crpxl-micsuc,occ GRNST,incr scat platy-arg chky PCKST prtgs/occ dns frag,rr crm-trns-l CHT incl-frag,rr xln ANHY AA,fr ool-intxl POR/tr chky fl,g even mod bri/scat bri yel FLOR,g ltbrn-tr brn STN,rr blk STN,CUT AA"
6490.00 6500.00	"LS AA,pred LS GRNST,abnt wh-crmplaty chky-arg PCKST prtgs,POR AA/tr chky fl,incr even bri-mod bri yel FLOR,STN AA,fr-tr slow strng CUT"
6500.00 6520.00	"LS tan-ltbrn,occ crm,brn,vfxl-gran-oolitic,crpxl-micsuc,v sl dol,tr crm-trns-l CHT incl-frag,rr ANHY xl,pred LS GRNST,decr scat LS PKST,fr-g intxl-ool POR,fr-g even mod bri-bri yel FLOR,fr ltbrn/rr brn STN,rr ppblk dd o STN,fr dif/tr slow strng CUT"
6520.00 6550.00	"LS AA,occ crm-wh,brn,vfxl-gran-oolitic,crpxl-micsuc,occ GRNST,v sl dol,tr scat PCKST AA,tr crm-trns-l CHT incl-rr frag,rr xln ANHY AA,g-fr ool-intxl POR,g even mod bri/scat bri yel FLOR,g ltbrn-tr brn STN,vrr blk pp dd o STN,g mod slow strng milky CUT"
6550.00 6570.00	"LS tan-ltbrn,occ crm-wh,brn,oolitic-crpxl-vfxl,gran-micsuc,pred ool LS GRNST,w/thin platy LS PKST incl,tr scat ANHY xl-incl,tr trns-l-wh CHT frag,v sl dol,g ool-tr intxl POR/tr chky fl,g mod bri-bri yel FLOR,fr ltbrn-brn-rr blk STN,g mod fast-slow CUT"
6570.00 6600.00	"LS AA,pred ool LS GRNST,sl dol,v sl anhy,incr scat dns crpxl & chky platy PCKST/tr chky POR fl,tr crm-bf-occ trns-l CHT frag-incl,rr trns-l xln ANHY frag,fr-g ool-tr intxl POR,g mod bri-bri yel FLOR,g ltbrn/tr scat brn STN,rr pp blk STN,g slow-mod fast CUT"
6600.00 6630.00	"LS AA,vfxl-oolitic-crpxl,gran-micsuc,occ GRNST,sl dol,v sl chky,w/decr PCKST prtgs & frag,rr crm-trns-l CHT incl-frag,rr xl ANHY,g-fr ool-intxl POR/vrr chky fl,g even mod bri/scat bri yel FLOR,g ltbrn-tr brn STN,rr blk STN,g mod fast-fast strng milky CUT"

DEPTH	LITHOLOGY
6630.00 6650.00	"LS AA,pred ooc LS GRNST,sl dol,v sl anhy,incr scat dns crpxl PCKST incl-frag,sl chky/tr POR fl,tr crm-bf-occ trns CHT frag-incl,rr trns xln ANHY,fr-g ooc-tr intxl POR,g even mod bri/scat bri yel FLOR,g ltbrn/tr brn STN,tr blk STN,fr dif/tr slowCUT "
6650.00 6670.00	"LS tan-ltbrn,occ crm-wh,brn,vfxl-oolcastic-crpxl,gran-micsuc,ooc GRNST,v sl dol,sl chky,decr scat PCKST,tr crm-trns CHT incl-rr frag,tr xln ANHY/rrPOR fl,fr-g ooc-intxl POR,g even mod bri/scat bri yel FLOR,g ltbrn-tr brn STN,tr blk pp dd o STN,CUT AA"
6670.00 6700.00	"LS AA,pred oolcastic LS GRNST,sl dol,v sl anhy,tr scat crpxl PCKST frag-incl,chky/tr POR fl,tr crm-bf-occ trns CHT frag-incl,rr trns xl ANHY,g ooc-tr intxl POR,g mod bri-bri yel FLOR,g ltbrn/tr scat brn STN,tr blk STN,CUT AA"
6700.00 6720.00	"LS tan-ltbrn,occ crm-wh,brn,vfxl-oolcastic-crpxl,gran-micsuc,ooc GRNST,sl dol,tr scat plty chky PCKST,tr CHT incl,rr xln ANHY,rr ool fos,fr-g ooc-intxl POR,g even mod bri/scat bri yel FLOR,g ltbrn-tr brn STN,rr blk pp dd o STN,g dif-slow strmg mlky CUT "
6720.00 6740.00	"LS AA,pred oolcastic LS GRNST,sl dol,v sl chky,tr scat crpxl PCKST frag-incl,chky/tr POR fl,tr crm-bf-occ trns CHT incl,rr trns xl ANHY,g ooc-tr intxl POR,g even dull-mod bri/tr bri yel FLOR,g ltbrn/incr scat brn STN,rr blk STN,CUT AA"
6740.00 6750.00	"LS AA,pred oolclastic GRNST,rr ool fos,tr scat PCKST,POR-FLOR AA,g ltbrn-decr brn STN,sl incr scat blk pp dd o STN,CUT AA"
6750.00 6770.00	"LS tan-brn-mbrn,occ crm-wh,crpxl-vfxl,gran-micsuc,pred oolcastic LS GRNST,w/rr thn wh crpxl dns plty LS PKST incl,rr ANHY xl-incl,rr trns CHT frag,n-v sl dol,fr ool-g intxl POR,fr-g dull-bri yel FLOR,fr ltbrn-brn-rr blk STN,fr-g slow-mod fast strmg CUT"
6770.00 6780.00	"LS AA,incr plty LS PKST,decr ool,scat ANHY xl,v rr CHT frag,sl decr POR-FLOR-STN-CUT"
6780.00 6800.00	"LS tan-ltbrn,occ crm-wh,brn,vfxl-oolcastic-crpxl,gran-micsuc,ooc GRNST,v sl dol,sl chky,decr scat PCKST,tr crm-trns CHT incl-rr frag,tr xln ANHY/rrPOR fl,fr-g ooc-intxl POR,g even mod bri/scat bri yel FLOR,g ltbrn-tr brn STN,tr blk pp dd o STN,CUT AA"
6800.00 6810.00	"LS AA,sl incr crpxl LS PKST,sl incr intxl POR,POR-FLOR-STN-CUT AA"
6820.00 6850.00	"LS tan-ltbrn,occ crm,v rr wh,crpxl-vfxl,micsuc-gran,vari amnts oolcastic,pred ool LS GRNST,w/scat dns LS PKST-occ plty,scat trns CHT frag,rr ANHY xl-incl,tr-g intxl-ool POR,fr-g dull-bri yel FLOR,tr-g ltbrn-brn STN,rr blk dd o STN,fr-g mod fast stmg CUT"
6850.00 6880.00	"LS tan,ltbrn-brn ip,occ crm-rr wh,crpxl-vfxl,occ gran-micsuc,fr oolcastic,pred intbd LS GRNST & tt-sl ool LS PKST,scat CHT frag & ANHY xl,tt-g intxl-ool POR,fr-g dull-bri yel FLor,tr-fr ltbrn-brn STN,rr blk dd o STN,tr-fr amnt g mod fast-fast stmg CUT"
6880.00 6900.00	"LS AA,g ool-tr intxl POR,fr-g dull-bri yel FLOR,tr-fr ltbrn-tr blk STN,fr-g mod fast stmg CUT"
6900.00 6930.00	"LS tan,occ brn,rr crm,crpxl-vfxl,occ gran-micsuc,oolcastic,v sl anhy,v rr CHT frag,pred LS GRNST,w/v thn intbd LS PKST,fr-g intxl-fr ool POR,fr-g dull-bri yel FLOR,tr-fr ltbrn-rr blk STN,fr g mod fast stmg CUT"

DEPTH	LITHOLOGY
6930.00 6950.00	"LS tan,ltbrn-brn ip,occ crm-rr wh,crpxl-vfxl,occ gran-micsuc,fr oolcastic,pred intbd LS GRNST & tt-sl ool LS PKST,scat CHT frag & ANHY xl,tt-g intxl-ool POR,fr-g dull-bri yel FLOR,tr-fr ltbrn-brn STN,rr blk dd o STN,tr-fr amnt g mod fast-fast stmg CUT"
6950.00 6970.00	"LS AA,g ool-tr intxl POR,fr-g dull-bri yel FLOR,tr-fr ltbrn-tr blk STN,fr-g mod fast stmg CUT"
6970.00 7000.00	"LS tan-ltbrn,occ crm,v rr wh,crpxl-vfxl,micsuc-gran,vari amnts oolcastic,pred ool LS GRNST,w/scat dns LS PKST-occ plty,scat trns CHT frag,rr ANHY xl-incl,tr-g intxl-ool POR,tr-fr dull-bri yel FLOR,tr ltbrn-brn STN,v rr blk dd o STN,fr mod fast stmg CUT"
7000.00 7010.00	"LS AA,sl incr trnsd-clr CHT frag,scat ANHY xl-incl,tr-fr dull-bri yel FLOR,tr ltbrn-brn STN,v rr blk dd o STN,POR-CUT AA"
7010.00 7030.00	"LS pred tan,occ brn-crm,crpxl-vfxl,tr oolcastic,micsuc-gran ip,pred ool LS GRNST,w/thn intbd sl oolmoldic LS PKST,scat trnsd-clr CHT frag,occ ANHY xl-incl tr POR fl,fr-g ool-intxl POR,tr-fr dull-tr bri yel FLOR,tr-fr ltbrn-v rr spty blk STN,g fast CUT"
7030.00 7040.00	"LS AA,sl incr CHT frag,,v sl decr intxl POR,FLOR-STN-CUT AA"
7040.00 7050.00	"7040'-7099' SAMPLE QUALITY QUESTIONABLE-DUE TO SAMPLES CAUGHT WHILE WELL FLOWING THROUGH CHOKE MANIFOLD TO GAS BUSTER & SKIMMER PITS W/O PUMPS"
7040.00 7070.00	"LS tan-ltbrn,crm,crpxl-vfxl,v oolcastic,tr ANHY-CALCITE fl oolcasts,trnsd ANHY incl & POR fl,rr trnsd CHT frag,occ sl ool LS PKST,fr-g ool-tr intxl POR,tr bri-fr dull yel FLOR,tr-fr ltbrn-brn-tr blk STN,fr mod fast-fast stmg CUT"
7070.00 7080.00	"LS AA,sl incr v tt ool LS PKST,POR-FLOR-STN-CUT AA"
7080.00 7099.00	"LS tan-brn,crm,crpxl-vfxl,v oolcastic-oolmoldic,v ool LS GRNST w/thn intbd tt sl ool LS PKST,occ ANHY xl in ool & scat ANHY incl,v sl dol,scat trnsd-clr CHT frag,fr-g ool-fr intxl POR,tr dull-bri yel FLOR,fr blk dd o STN,tr-fr brn STN,tr of g fast CUT"
7099.00 7130.00	"LS tan,crm-wh,lt brn,occ brn,vfxl-crpxl-oolclastic,gran-micsuc,occ GRNST,tr dol cmt,sl chky-POR fl,tr scat PCKST,tr CHT frag-incl,tr-rr xl trnsd ANHY,fr-g ooc-intxl POR,g mod bri/ scat bri yel FLOR,fr-g ltbrn/tr brn,rr blk STN,g mod fast strmg mlky CUT"
7099.00 7120.00	"DOL brn,micsuc-vfxl,rthy,sl slty,prob cvgs,g intxl POR,g bri yel FLOR,g slow strmg-blooming CUT"
7130.00 7150.00	"LS tan,ltbrn,occ crm-wh,brn,vfxl-crpxl-oolclastic,gran-micsuc,occ GRNST,tr scat thn plty chky PCKST frag,tr xl ANHY frag,tr bf-crm CHT incl,rr mic fos & ool,g ooc/tr intxl POR,vrr chk fl POR,g even mod bri-br yel FLOR,g ltbrn/incr brn STN,CUT AA"
7150.00 7160.00	"LS AA,pred ooc GRNST,sl incr scat PCKST AA,POR-FLOR AA,g ltbrn/rr brn STN,incr scat pp blk dd o STN,g dif/tr slow strmg CUT"
7160.00 7180.00	"LS tan,incr crm-wh,occ brn,crpxl-vfxl,micsuc-gran,tr oolclastic,pred ool LS GRNST,w/thn intbd LS PKST,cln-sl chky,rr mic fos,rr trnsd-clr CHT frag,rr ANHY xl-incl/tr POR fl,fr-g ool-intxl POR,tr-fr dull-tr bri yel FLOR,tr-fr ltbrn-v rr pp blk STN,CUT AA"

DEPTH	LITHOLOGY
7180.00 7200.00	"LS tan,crm-wh-trnsl,occ brn,crpxl-vfxl-gran,occ ooliticlastic,occ GRNST/scat PCKST frag-tr incl,cln,sl chk,v sl dol,fr-g ooc-intxl POR,g even mod bri-scat bri yel FLOR,g-fr ltbrn/tr brn STN,rr blk pp STN,g dif/tr slow strmg CUT"
7200.00 7220.00	"LS pred tan,crm-wh-trnsl,occ brn,crpxl-vfxl-gran,occ ooliticlastic,occ GRNST/scat PCKST frag-tr incl,cln,sl chk,v sl dol,rr CHT incl,rr xln ANHY,fr-g ooc-intxl POR,g even mod bri-scat bri yel FLOR,g-fr ltbrn/tr brn STN,rr blk pp STN,g dif/tr slow strmg CUT"
7220.00 7240.00	"LS tan,crm-wh-trnsl,incr brn,crpxl-vfxl-gran,occ ooliticlastic,occ GRNST/scat PCKST frag-rr incl,cln,sl chk,rr-tr scat xln ANHY frag,v sl dol,fr-g ooc-intxl POR,g even mod bri-scat bri yel FLOR,g-fr ltbrn/tr brn STN,rr blk pp STN,g dif/tr slow strmg CUT"
7240.00 7260.00	"LS AA,incr ooliticlastic,occ GRNST/scat PCKST frag,cln,sl chk,v sl dol,incr scat xl ANHY,g-fr ooc-intxl POR,g even mod bri-scat bri yel FLOR,g-fr ltbrn/tr brn STN,rr blk pp STN,g dif/tr-fr v slow strmg CUT"
7260.00 7280.00	"LS AA,occ GRNST/scat PCKST frag,cln,sl chk,v sl dol,rr scat xl ANHY,rr crm-trnsl CHT frag-incl,g-fr ooc-intxl POR,g even mod bri/incr scat bri yel FLOR,g-fr ltbrn/tr brn STN,rr blk pp STN,g dif/tr-fr v slow strmg CUT"
7280.00 7300.00	"LS tan,incr crm-wh-trnsl,brn,crpxl-vfxl-gran,occ ooliticlastic,occ GRNST/scat PCKST frag-incl,cln,chk,rr scat xln ANHY frag,v sl dol,fr-g ooc-intxl POR,g even mod bri-scat bri yel FLOR,g-fr ltbrn/tr brn STN,rr blk pp STN,g dif/tr slow strmg CUT"
7300.00 7310.00	"LS tan,crm-wh,occ brn,crpxl-vfxl-gran,occ ooliticlastic,occ GRNST/scat PCKST frag-rr incl,cln,sl chk,rr scat xln ANHY frag,v sl dol,fr-g ooc-intxl POR,g even mod bri-scat bri yel FLOR,g-fr ltbrn/tr brn STN,rr blk pp STN,g dif/tr slow strmg CUT"
7310.00 7330.00	"LS AA,incr ooliticlastic,occ GRNST/scat PCKST frag,cln,sl chk,v sl dol,rr scat xl ANHY,g-fr ooc-intxl POR,g even mod bri-scat bri yel FLOR,g-fr ltbrn/tr brn STN,rr blk pp STN,g dif/tr-fr v slow strmg CUT"
7330.00 7350.00	"LS AA,ooliticlastic GRNST/scat PCKST frag,cln,sl chk,v sl dol,incr scat xl ANHY,rr mic fos & ool,g-fr ooc-intxl POR,g even mod bri-dull/scat bri yel FLOR,g-fr ltbrn/tr brn STN,rr blk pp STN,g dif/tr-fr v slow strmg CUT"
7350.00 7370.00	"NOTE:DECREASING SAMPLE SIZE" "LS tan-brn,occ crm,crpxl-vfxl,gran-micsuc ip,occ dns,pred sl ooliticlastic LS GRNST,w/intbd thn LS PKST,v rr scat trnsl CHT frag,v rr ANHY xl,fr-g intxl-ool POR,fr dull-bri yel FLOR,rr mod fast dif-tr mod fast stmg CUT"
7370.00 7380.00	"LS AA,sl incr ool POR,decr stmg CUT,FLOR-STN AA"
7380.00 7390.00	"LS AA,incr v sl ool LS PKST,incr trnsl CHT frag-trnsl ANHY xl-rr incl,decr ool-intxl POR,FLOR-STN-CUT AA"
7390.00 7400.00	"LS AA,incr ool POR,fr-g ool-tr intxl POR,fr dull-tr bri yel FLOR,rr brn-v rr blk dd o STN,rr g mod fast-slow stmg CUT"

DEPTH	LITHOLOGY
7400.00 7430.00	"LS tan-ltbrn,occ brn-crm,micxl-vfxl,gran-suc,occ crpxl,oolicastic-oolmoldic,pred LS GRNST w/thn intbd sl ool LS PKST,scat trnsI CHT frag,rr ANHY xl,fr-g intxl-tr-fr ool POR,fr dull-tr bri yel FLOR,tr-fr brn-tr blk dd o STN,fr-g slow dif-tr mod fast CUT"
7430.00 7440.00	"LS AA decr LS PKST,incr brn STN,POR-FLOR-CUT AA"
7440.00 7450.00	"LS AA,scat wh-crm plty chk LS PKST frag,FLOR-STN-CUT AA,sl incr intxl POR"
7450.00 7490.00	"LS tan-ltbrn,occ brn-crm,micxl-vfxl,gran-suc,occ crpxl,pred oolicastic LS GRNST w/intbd sl ool occ plty LS PKST,scat trnsI CHT frag,rr ANHY xl,fr-g intxl-fr ool POR,fr dull-bri yel FLOR,tr-fr brn-tr-fr blk dd o STN,fr-g slow dif-tr-fr mod fast stmg CUT"
7490.00 7520.00	"LS tan-ltbrn,occ brn-crm,micxl-vfxl,gran-suc,occ crpxl,oolicastic-oolmoldic,pred LS GRNST w/thn intbd sl ool LS PKST,scat trnsI CHT frag,rr ANHY xl,fr-g intxl-tr-fr ool POR,fr dull-tr bri yel FLOR,tr-fr brn-tr blk dd o STN,fr-g slow dif-tr mod fast CUT"
7520.00 7530.00	"LS AA,intbd v sl ool occ plty LS PKST & v oolicastic-oolmoldic LS GRNST,fr intxl-tr-g ool POR,fr dull-tr bri yel FLOR,tr lt-mbrn STN,tr blk dd o STN,fr slow-fast stmg CUT"
7530.00 7560.00	"LS tan-brn,occ crm,micxl-vfxl,gran-suc,occ crpxl,v oolicastic-sl oolmoldic,pred LS GRNST w/thn intbd LS PKST,v rr trnsI-clr CHT frag,rr ANHY xl,fr-g ool-intxl POR,fr dull-tr spty bri yel FLOR,fr-g brn-rr blk STN,fr-g mod fast-slow stmg CUT"
7550.00 7560.00	"LS AA,incr ool POR,FLOR-STN-CUT AA"
7560.00 7590.00	"LS tan-ltbrn,occ brn-crm,micxl-vfxl,gran-suc,occ crpxl,pred oolicastic LS GRNST w/thn intbd sl ool occ plty LS PKST,scat trnsI CHT frag,rr ANHY xl,fr-g intxl-ool POR,fr dull-bri yel FLOR,tr-fr brn STN,tr-fr blk dd o STN,fr-g slow-fr mod fast stmg CUT"
7590.00 7610.00	"LS tan,occ ltbrn-brn,crpxl-vfxl,occ gran-micsuc,oolicastic ip,pred micxl-micsuc LS GRNST,w/intbd LS PKST & ool vfxl-gran LS GRNST,scat trnsI CHT frag & ANHY xl-incl,fr-g intxl-fr ool POR,fr dull-bri yel FLOR,tr-fr ltbrn-tr blk dd o STN,fr-g slow-fast CUT"
7610.00 7640.00	"LS tan-brn,occ crm,micxl-vfxl,gran-suc,occ crpxl,v oolicastic-sl oolmoldic,pred LS GRNST w/thn intbd LS PKST,v rr trnsI-clr CHT frag,rr ANHY xl,fr-g ool-intxl POR,fr dull-tr spty bri yel FLOR,fr-g brn-rr blk STN,fr-g mod fast-slow stmg CUT"
7640.00 7660.00	"LS AA,intbd v sl ool occ plty LS PKST & v oolicastic-oolmoldic LS GRNST,fr intxl-tr-g ool POR,fr dull-tr bri yel FLOR,tr lt-mbrn STN,tr blk dd o STN,fr slow-fast stmg CUT"
7660.00 7670.00	"LS AA,pred oolicastic-sl oolmoldic LS GRNSTN,incr LS PKST sl pkty-chk ip,POR-FLOR-STN-CUT AA"
7670.00 7710.00	"LS tan-brn,occ crm,micxl-vfxl,gran-suc,occ crpxl,v oolicastic-sl oolmoldic,pred LS GRNST w/thn intbd LS PKST,v rr trnsI-clr CHT frag,rr ANHY xl,fr-g ool-intxl POR,fr dull-tr spty bri yel FLOR,fr-g brn-rr blk STN,fr-g mod fast-slow stmg CUT"
7710.00 7720.00	"LS AA,incr tt LS PKST,occ plty-chk,v sl decr POR-FLOR-STN-CUT "

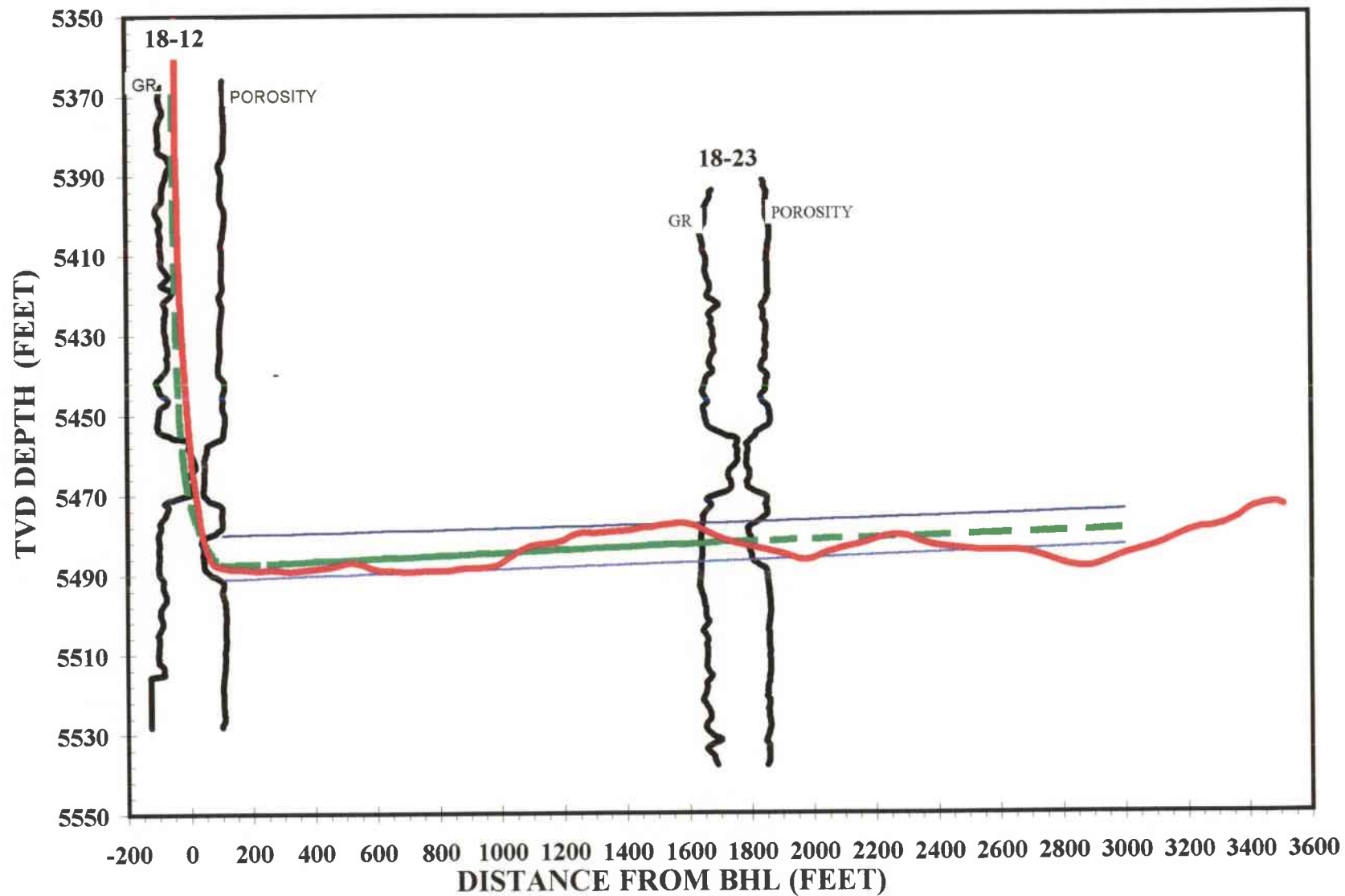
DEPTH	LITHOLOGY
7720.00 7750.00	"LS tan-ltbrn,occ brn-crm,micxl-vfxl,gran-suc,occ crpxl,oolicastic-oolmoldic,pred LS GRNST w/thn intbd sl ool LS PKST,scat trnsd CHT frag,rr ANHY xl,fr-g intxl-tr-fr ool POR,fr dull-tr bri yel FLOR,fr-brn-tr blk dd o STN,fr-g slow-fr mod fast stmg CUT"
7750.00 7800.00	"LS tan-ltbrn,occ brn-crm,micxl-vfxl,gran-micsuc,v ool-pred LS GRNST,w/scat intbd occ plty-ool LS PKST,scat trnsd-ltgy CHT frag,v rr ANHY xl-incl,fr-g intxl-fr ool POR,fr dull-spty bri yel FLOR,fr-fr ltbrn-brn STN,rr-tr blk STN,fr slow-mod fast stmg CUT"
7800.00 7820.00	"LS AA,w/v thn occ plty oolmoldic LS PKST,fr-g intxl-ool POR,fr-g dull-fr spty bri yel FLOR,fr-fr ltbrn-rr brn STN,rr blk dd o STN,fr slow-mod fast stmg CUT"
7819.00 7840.00	"LS AA,intbd v sl ool occ plty LS PKST & v oolicastic-oolmoldic LS GRNST,fr intxl-tr-g ool POR,fr dull-tr bri yel FLOR,fr lt-mbrn STN,rr blk dd o STN,fr slow-fast stmg CUT"
7840.00 7870.00	"LS tan-ltbrn,occ brn-crm,micxl-vfxl,gran-suc,occ crpxl,pred oolicastic LS GRNST w/thn intbd sl ool occ plty LS PKST,scat trnsd CHT frag,rr ANHY xl,fr-g intxl-ool POR,fr dull-bri yel FLOR,fr-fr brn STN,fr blk dd o STN,fr-g slow-fr mod fast stmg CUT"
7870.00 7900.00	"LS tan-ltbrn,occ brn-crm,micxl-vfxl,gran-suc,occ crpxl,pred oolicastic LS GRNST w/thn intbd sl ool-occ plty LS PKST,rr scattrnsd CHT frag & ANHY xl,fr-g intxl-ool POR,fr even dull-scat bri yel FLOR,rr brn STN,rr blk dd o STN,fr dif/tr-fr slow stmg CUT"
7900.00 7920.00	"LS pred tan-ltbrn,incr crm,occ brn,wh-trnsd,vfxl-micxl,gran-micsuc-crpxl,pred oolicastic LS GRNST w/thn intbd sl ool-occ plty LS PKST,rr scat trnsd CHT frag,rr ANHY xl,fr-g intxl-ool POR,fr even dull-scat bri yel FLOR,fr-fr brn STN/tr blk dd o STN,CUT AA"
7920.00 7950.00	"LS tan,ltbrn,occ crm-wh,brn,vfxl-gran,micxl-crpxl,occ oolclastic,occ GRNST,rr scat PCKST frag/rr plty chky prtgs,rr-tr trnsd xl ANHY,rr crm-trnsd CHT incl,fr-g intxl-ool POR,fr ltbrn/tr brn STN,rr-tr blk pp STN,fr dif/tr v slow strmg mlky CUT"
7950.00 7970.00	"LS tan,ltbrn,occ crm-wh,brn,vfxl-gran,micxl-crpxl,incr oolclastic,occ GRNST,rr scat PCKST frag/vrr plty chky prtgs,incr crm-trnsd CHT incl,rr scat trnsd xl ANHY,fr-g ooc-intxl POR,fr ltbrn/tr brn STN,rr blk pp STN,g-fr dif/tr-fr slow strmg mlky CUT"
7970.00 7980.00	"LS AA,incr oolclastic GRNST frag,rr PCKST AA,g ooc-intxl POR/FLOR-STN-CUT AA "
7980.00 8000.00	"LS AA,decr oolclastic frag,pred ooc GRNST/tr scat PCKST,cln,v sl dol,rr intbd CHT AA,rr-tr xl ANHY frag,vrr mic fos,fr-g ooc-intxl POR,fr-g even dull-mod bri/scat bri yel FLOR,fr ltbrn/tr scat brn STN,rr scat blk pp dd o STN,g dif/tr mod fast-slow CUT "
8000.00 8030.00	"LS tan-ltbrn,occ brn-crm,micxl-vfxl,gran-suc,occ crpxl,pred oolclastic LS GRNST w/thn intbd sl plty LS PKST,rr br-crm CHT incl,rr ANHY xl,fr-g intxl-ool POR,fr dull-bri yel FLOR,fr-g ltbrn-brn STN,rr blk pp dd o STN,fr-g dif/fr mod slow stmg CUT"
8030.00 8050.00	"LS tan-ltbrn,incr brn,occ crm,vfxl-gran,micxl-crpxl,pred oolclastic LS GRNST,w/scat dns-rr sl plty LS PKST,rr br-crm CHT incl,rr ANHY xl,fr-g intxl-ool POR,fr mod bri/scat bri yel FLOR,fr-g ltbrn-brn STN,rr blk pp dd o STN,fr-g dif/fr slow stmg mlky CUT "

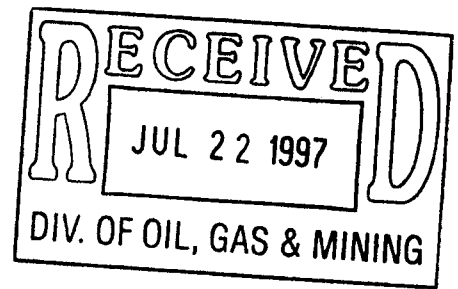
DEPTH	LITHOLOGY
8050.00 8070.00	"LS AA,pred ooc GRNST/scat dns-tr plty-arg chky PCKST,cln,v sl dol,tr intbd CHT AA,rr-tr xl ANHY frag,vrr ool-mic fos,fr-g intxl-ooc POR,fr-g even dull-mod bri/scat bri yel FLOR,fr ltbrn/incr brn STN,rr scat blk pp dd o STN,g mod fast-slow strmg mlky CUT"
8070.00 8100.00	"LS tan-ltbrn,brn,occ crm,vfxl-gran,micxl-crpxl,pred oolitic LS GRNST/scat dns-rr plty-arg LS PKST,tr tan-crm CHT incl,rr ANHY xl,rr ool fos,fr-g intxl-ool POR,fr mod bri/scat bri yel FLOR,fr-g ltbrn-brn STN,rr blk pp dd o STN,fr-g dif/tr slow stmg CUT"
8100.00 8120.00	"LS AA,pred ooc GRNST/scat dns-tr plty-arg chky PCKST,cln,v sl dol,tr intbd CHT AA,rr-tr xl ANHY frag,vrr ool-mic fos,fr-g intxl-ooc POR,fr-g even dull-mod bri/scat bri yel FLOR,fr ltbrn/incr brn STN,rr scat blk pp dd o STN,fr dif/tr slow strmg mlky CUT"
8120.00 8150.00	"LS tan-ltbrn,brn,occ crm,vfxl-gran,micxl-crpxl-micsuc,oolitic LS GRNST/scat chky dns-rr plty-arg LS PKST,tr CHT incl AA,rr ANHY xl,fr-g intxl-ool POR,g even mod bri-scat bri yel FLOR,fr-g ltbrn-brn STN,rr-tr blk pp dd o STN,g dif/fr-tr slow stmg CUT"
8150.00 8170.00	"LS tan-ltbrn,incr brn,occ crm-wh,vfxl-crpxl-oolitic,micxl-gran,incr ooc GRNST/sl chky-tr POR fl,tr scat dns-tr plty chky-arg PCKST,tr trns-l-crm CHT incl,rr xl ANHY,rr mic fos-ool,g ooc-intxl POR,FLOR AA,g ltbrn-brn STN/fr scat blk pp STN,CUT AA "
8170.00 8180.00	"LS AA,pred oolitic LS GRNST/tr scat PCKST AA,POR-FLOR AA,STN AA/incr scat blk STN,fr-g slow strmg mlky CUT"
8180.00 8200.00	"LS tan-ltbrn,brn,occ crm,vfxl-gran-oolitic,micxl-crpxl,pred oolitic LS GRNST/scat dns LS PKST,tr CHT incl,vrr ANHY xl,rr ool,fr-g ooc-intxl-ool POR,fr even mod bri/scat bri yel FLOR,fr-g ltbrn-brn STN,rr blk pp dd o STN,fr-g dif/tr slow stmg CUT"
8200.00 8220.00	"LS tan-crm,ltbrn,occ trns-l,brn,vfxl-gran,crpxl-oolitic,ool GRNST,sl dol,tr scat dns-vrr plty PCKST,sl chky,tr bf-crm CHT incl,vrr xl ANHY,g intxl-ooc POR,g even dull-mod bri/tr scat bri yel FLOR,fr ltbrn/tr brn STN,incr blk STN,fr dif/tr slow CUT "
8220.00 8250.00	"LS tan-ltbrn,brn,occ crm-wh-trns-l,incr oolitic-vfxl-gran,occ crpxl,ool GRNST,tr scat PCKST frag/vrr plty chky prigs,incr crm-trns-l CHT incl,vrr scat trns-l xl ANHY,g ooc-fr intxl POR,FLOR AA,fr ltbrn-incr brn/blk pp STN,g-fr slow strmg mlky CUT"
8250.00 8270.00	"LS tan-ltbrn,brn,occ crm,vfxl-gran,micxl-crpxl-micsuc,oolitic LS GRNST/scat chky dns-rr plty-arg LS PKST,tr CHT incl AA,rr ANHY xl,fr-g intxl-ool POR,g even mod bri-scat bri yel FLOR,fr-g ltbrn-brn STN,rr-tr blk pp dd o STN,g dif/fr-tr slow stmg CUT"
8270.00 8280.00	"LS ltbrn-tan,brn,occ crm,vfxl-gran,oolitic-crpxl,ool LS GRNST/tr dns-rr plty LS PKST,tr CHT incl AA,rr ANHY xl,fr-g intxl-ool POR,g even dull-mod bri/tr scat bri yel FLOR,g ltbrn-brn STN,fr blk pp dd o STN,g blooming-slow stmg mlky CUT"
8280.00 8300.00	"LS AA,decr brn,occ crm,vfxl-gran,oolitic-crpxl,ool LS GRNST/tr dns-rr plty LS PKST,fr-g intxl-ool POR,g even dull-mod bri/decr scat bri yel FLOR,g ltbrn-brn STN,decr blk pp dd o STN,g-fr dif/tr slow strmg mlky CUT"

DEPTH	LITHOLOGY
8300.00 8330.00	"LS tan,litbrn,occ crm-wh,brn,vfxl-gran,crpxl-ooliticlastic,oo GRNST,tr scat PCKST frag/rr plty chky prtgs,tr-rr trnsi xl ANHY,tr crm-bf CHT incl,fr-g intxl-ool POR,fr litbrn/tr brn STN,tr-rr blk pp STN,fr dif/tr v slow strmg mlky CUT"
8330.00 8350.00	"LS AA,sl incr brn,occ crm,vfxl-gran,ooliticlastic-crpxl,oo LS GRNST/tr dns-rr plty LS PKST,rr-tr xln ANHY,rr ool,fr-g intxl-ool POR,g even dull-mod bri/fr scat bri yel FLOR,g litbrn-incr brn STN,rr scat blk dd o STN,g-fr slow-mod fast strmg mlky CUT"
8350.00 8370.00	"LS tan-litbrn,occ crm-wh,brn,vfxl-gran,crpxl-ooliticlastic,oo GRNST,tr scat PCKST frag/rr plty chky prtgs,rr trnsi xl ANHY,tr crm-bf CHT incl,rr mic fos & ool,fr-g intxl-ool POR,FLOR AA,fr litbrn/tr scat brn STN,rr blk pp STN,fr dif/tr slow strmg mlky CUT"
8370.00 8390.00	"LS tan-litbrn,brn,occ crm-wh,vfxl-gran,micxl-crpxl-micsuc,oo LS GRNST/incr plty chky-arg/occ dns LS PKST,rr CHT incl,vrr ANHY xl,fr-g intxl-ool POR,g even mod bri-scat bri yel FLOR,fr-g litbrn-brn STN,rr blk pp dd o STN,g dif/fr-tr slow strmg CUT"
8390.00 8400.00	"LS AA,v sl incr wh-crm plty LS PKST"
8400.00 8410.00	"LS pred intbd ool LS GRNST-wh-crm plty LS PKST,decr POR-FLOR-STN CUT"
8410.00 8420.00	"LS tan-litbrn,brn,occ wh-crm,pred ool LS GRNST w/intbd v sl ool-plty LS PKST,fr-g intxl-fr ool POR,fr-fr dull-tr bri yel FLOR,fr-fr litbrn-brn-tr blk STN,fr-fr g slow-mod fast CUT"
8420.00 8430.00	"POOR SPL QUALITY""LS AA,incr ool-gran POR,FLOR-STN-CUT AA"
8430.00 8450.00	"LS tan-brn,occ wh-crm,crpxl-vfxl,gran-micsuc,occ suc,ooliticlastic-v sl oolmoldic,pred LS GRNST,w/thn intbd occ plty LS PKST,scat trnsi-crl CHT frag,rr-tr ANHY xl-incl,fr-g intxl-tr ool POR,fr-g dull-tr bri yel FLOR,fr litbrn-tr blk STN,fr-g slow-tr fast CUT"
8450.00 8470.00	"POOR SPL QUALITY""LS AA,decr ool POR,fr-g slow-tr mod fast strmg CUT,FLOR-STN AA"
8470.00 8500.00	"LS tan-brn,occ wh-crm,crpxl-vfxl,gran-micsuc,occ suc,v sl ooliticlastic-oolmoldic,pred LS GRNST,w/intbd occ plty LS PKST,scat trnsi-crl CHT frag,rr-tr ANHY xl-incl,fr-g intxl-tr ool POR,fr-g dull-tr bri yel FLOR,fr litbrn-tr blk STN,fr-g slow-tr mod fast CUT"
8500.00 8520.00	"LS tan-brn,occ wh-crm,crpxl-vfxl,gran-micsuc,occ suc,ooliticlastic-sl oolmoldic,pred LS GRNST,w/thn intbd occ plty LS PKST,scat trnsi-crl CHT frag,rr ANHY xl-incl,fr-g intxl-tr ool POR,fr-g dull-tr bri yel FLOR,fr litbrn-tr blk STN,fr-g slow-tr mod fast CUT"
8520.00 8540.00	"LS tan-brn,occ wh-crm,crpxl-vfxl,gran-micsuc,sl suc,ooliticlastic-v sl oolmoldic,pred LS GRNST,w/intbd tt-sl plty LS PKST,scat trnsi-crl CHT frag,rr-tr ANHY xl-incl,fr-g intxl-tr ool POR,fr dull-tr bri yel FLOR,fr litbrn-tr blk STN,g slow-fr mod fast CUT"
8540.00 8550.00	"LS AA,pred ooliticlastic-v sl oolmoldic LS GRNST,incr intxl-ool POR,incr bri yel FLOR,STN-CUT AA"
8550.00 8570.00	"LS tan-brn,occ wh-crm,crpxl-vfxl,gran-micsuc,occ suc,v sl ooliticlastic-oolmoldic,pred LS GRNST,w/intbd occ plty LS PKST,scat trnsi-crl CHT frag,rr-tr ANHY xl-incl,fr-g intxl-tr ool POR,fr-g dull-tr bri yel FLOR,fr litbrn-tr blk STN,fr-g slow-tr mod fast CUT"

DEPTH	LITHOLOGY
8570.00 8580.00	"LS AA,incr trnsf-clr CHT frag,POR-FLOR-STN-CUT AA"
8580.00 8600.00	"LS tan-brn,occ wh-crm,crpxl-vfxl,gran-micsuc,occ suc,oolicastic-v sl oolmoldic,pred LS GRNST,w/thn intbd occ plty LS PKST,scat trnsf-clr CHT frag,rr-tr ANHY xl-incl,fr-g intxl-tr ool POR,fr-g dull-tr bri yel FLOR,fr ltrn-tr blk STN,fr-g slow-tr fast CUT"
8599.00 8610.00	"LS AA,incr ANHY xl-incl,incr plty tt v sl ool LS PKST,sl decr intxl POR,FLOR-STN-CUT AA"
8610.00 8650.00	"LS tan-brn,occ wh-crm,crpxl-vfxl,gran-micsuc,sl suc,oolicastic-v sl oolmoldic,pred LS GRNST,w/intbd tt-sl plty LS PKST,scat trnsf-clr CHT frag,rr-tr ANHY xl-incl,fr-g intxl-tr ool POR,fr dull-tr bri yel FLOR,fr ltrn-tr blk STN,g slow-fr mod fast CUT"
8650.00 8670.00	"LS crm-tan,occ brn,rr wh,crpxl-vfxl,gran-micsuc ip,scat plty wh-crm crpxl tt v sl ool LS PKST,pred sl oolicastic-oolmoldic LS GRNST,scat ANHY xl-incl,rr trnsf-clr CHT frag,tt-fr intxl-tr ool POR,fr dull-rr spty bri yel FLOR,rr-fr brn-tr blk STN,fr g CUT"
8670.00 8700.00	"LS tan,crm-ltrn,occ brn,wh ip,crpxl-vfxl,occ gran-micsuc,oolicastic-oolmoldic ip,intbd LS GRNST & LS PKST,scat CHT frag & ANHY xl-incl,tt-g intxl-tr ool POR,rr-fr dull-tr spty bri yel FLOR,rr-fr brn STN,rr blk dd o STN,rr of g slow-mod fast stmg CUT"
8700.00 8720.00	"LS AA,incr intxl & ool POR,FLOR-STN-CUT AA"
8720.00 8740.00	"LS AA,pred v sl ool LS GRNST,w/incr tt-v rr micxl LS PKST,decr POR,fr dull-tr bri yel FLOR,rr frnt brn-ltrn STN,rr blk dd o STN,fr-g slow-tr mod fast stmg CUT"
8740.00 8760.00	"LS tan-brn,occ wh-crm,crpxl-vfxl,gran-micsuc,occ suc,oolicastic-v sl oolmoldic,pred LS GRNST,w/thn intbd occ plty LS PKST,scat trnsf-clr CHT frag,rr-tr ANHY xl-incl,fr-g intxl-tr ool POR,fr-g dull-tr bri yel FLOR,fr ltrn-tr blk STN,fr-g slow-tr fast CUT"
8760.00 8770.00	"LS AA,incr v sl ool-occ plty-crpxl-micxl LS PKST,sl decr ool-intxl POR,FLOR-STN-CUT AA"
8770.00 8800.00	"LS tan,occ ltrn-brn,crm-wh ip,crpxl-vfxl,occ gran-micsuc,sl oolicastic,pred intbd sl ool LS GRNST & tt-plty LS PKST,occ scat trnsf-clr CHT frag-ANHY xl,rr-fr intxl-tr ool POR,rr-fr dull-tr bri yel FLOR,rr-fr ltrn-brn-tr blk STN,rr g slow-mod fast CUT"
8800.00 8810.00	"LS AA,incr LS PKST,incr CHT frag,POR-FLOR-STN-CUT AA"
8810.00 8840.00	"LS tan-brn,occ wh-crm,crpxl-vfxl,gran-micsuc,occ suc,oolicastic-v sl oolmoldic,pred LS GRNST,w/thn intbd occ plty LS PKST,scat trnsf-clr CHT frag,rr-tr ANHY xl-incl,fr-g intxl-tr ool POR,fr-g dull-tr bri yel FLOR,fr ltrn-tr blk STN,fr-g slow-tr fast CUT"
8840.00 8860.00	"LS AA,pred v sl ool LS GRNST,w/incr tt-v rr micxl LS PKST,decr POR,fr dull-tr bri yel FLOR,rr frnt brn-ltrn STN,rr blk dd o STN,fr-g slow-tr mod fast stmg CUT"
8860.00 8890.00	"LS tan-ltrn,crm,incr brn,occ wh-trnsf,crpxl-vfxl,gran-micsuc,oolicastic-sl oolmoldic,intbd LS GRNST & LS PKST,rr CHT frag & rr ANHY xl-incl,g intxl-tr ool POR,g even dull-mod bri yel FLOR,rr-fr brn STN,rr blk dd o STN,g-fr slow-mod fast stmg CUT"

DEPTH	LITHOLOGY
8890.00 8910.00	"LS tan,litbrn,occ brn,wh-crm,crpxl-vfxl-gran,oolicastic-v sl oolmoldic,pred LS GRNST,w/thn intbd dns-plty chky LS PKST,scat trns-lmky CHT frag,tr ANHY xl-incl,fr-g intxl-tr ool POR,g even mod bri-bri yel FLOR,fr litbrn-incr scat brn/fr blk STN,g fast CUT"
8910.00 8930.00	"LS AA,crpxl-vflx,gran-micsuc,incr oolicastic,intbd ooc LS GRNST & chky plty-occ dns LS PKST,tr CHT frag & xl ANHY frag-incl,g ooc-intxl-tr ool POR,g even mod bri-bri yel FLOR,fr litbrn-incr brn/blk dd o STN,tr scat pp blk STN,g dif/slow-mod fast strmg CUT "
8930.00 8950.00	"LS AA/incr wh-crm,occ brn,crpxl-vfxl-gran,oolicastic,pred LS GRNST ooc ooc,w/intbd dns-plty v chky LS PKST,tr trns-lmky CHT incl-frag,tr ANHY xl-incl,fr-g intxl-tr ooc POR/occ chky-anhy fl,g even mod bri-bri yel FLOR,STN AA,g fast-mod fast strmg CUT"
8950.00 8970.00	"LS litbrn-tan,crm,occ brn,vfxl-micsuc-crpxl,gran-ooliclastic,GRNST ooc ooc/tr scat dns-rr plty PCKST,sl chky-anhy,tr CHT AA,rr xl ANHY frag-incl,g-fr intxl-ooc POR,g even mod bri-bri yel FLOR,g-fr litbrn-brn STN,tr scat blk STN,g-fr slow strmg mlky CUT"
8970.00 9000.00	"LS tan,litbrn,crm-wh,occ brn,crpxl-gran-vfxl,occ ooliclastic,GRNST/incr scat dns-plty chky PCKST,v-sl chky,sl anhy-tr xl ANHY frag-incl,tr bf-crm CHT incl-frag,fr-g intxl-tr ooc POR/tr chk fl,fr-g even dull-mod bri yel FLOR,fr STN AA/tr blk STN,fr dif CUT"
9000.00 9020.00	"LS AA,vfxl-gran,crpxl-micxl,occ micsuc-ooliclastic,incr GRNST ooc ooc,scat dns-plty chky PCKST,incr chk,sl-v sl anhy/rr xln ANHY frag,rr bf-trns-lmky CHT incl,g-fr intxl-tr ooc POR,fr even dull-mod bri yel FLOR,fr litbrn/tr brn STN,rr pp blk STN,g dif CUT"
9020.00 9040.00	"LS tan,litbrn,crm-wh,occ brn,crpxl-gran-vfxl,occ ooliclastic,pred GRNST ooc ooc/scat dns-plty chky PCKST,sl anhy-tr xl ANHY frag-incl,tr bf-crm CHT incl-frag,fr-g intxl-tr ooc POR/tr chk fl,FLOR AA,fr STN AA/tr blk STN,fr dif/tr slow strmg mlky CUT"
9040.00 9070.00	"LS litbrn-tan,crm-wh,occ brn,vfxl-crpxl,gran-micxl,occ ooc,pred GRNST/scat PCKST AA,chky-sl anhy,tr CHT AA,rr xl ANHY frag-incl,g-fr intxl/tr-rr ooc POR,g-fr even dull-mod bri yel FLOR,g-fr litbrn/tr brn-rr scat blk pp STN,g dif/tr slow strmg mlky CUT"
9070.00 9080.00	"LS tan-litbrn,crm,occ brn,wh,vfxl-micsuc-crpxl,ooliclastic,pred GRNST/tr scat ooc frag,tr chky plty-dns PCKST,sl anhy/rr ANHY xl frag,tr crm-bf CHT incl,g intxl-tr ooc POR,g mod bri-bri yel FLOR,fr litbrn-tr brn-scat blk dd o STN,g blooming-slow strmg CUT"
9080.00 9100.00	"LS AA,pred LS GRNST,tr scat chky plty-dns PCKST,fr-g intxlPOR/tr ooc POR,fr-g even dull-mod bri yel FLOR,decr STN AA,fr dif/tr slow strmg CUT"
9100.00 9124.00	"LS tan-litbrn,crm,occ brn,wh,vfxl-micsuc-crpxl,gran,sl ooliclastic,pred GRNST,tr PCKST AA,sl anhy/rr ANHY xl frag,tr crm-bf CHT incl,g intxl-tr ooc POR,g mod bri-dull/tr scat bri yel FLOR,fr litbrn-tr brn/scat blk dd o STN,g blooming-slow strmg CUT"

MOBIL, Ratherford #14-32, Southeast Lateral



MOBIL
43 037 31153
RATHERFORD UNIT #18-12
NW HORIZONTAL LATERAL LEG #2
UPPER 1-A POROSITY BENCH
DESERT CREEK MEMBER
PARADOX FORMATION
SECTION 18, T41S, ~~R23E~~ R24E
SAN JUAN, UTAH

✓

GEOLOGY REPORT
by
DAVE MEADE & MARVIN ROANHORSE
ROCKY MOUNTAIN GEO-ENGINEERING CORP.
GRAND JUNCTION, COLORADO
(970) 243-3044

MICROFICHE

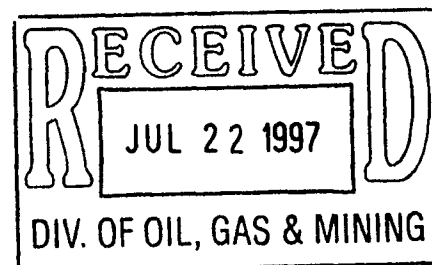


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WELL SUMMARY

OPERATOR: MOBIL EXPLORATION & PRODUCTION U.S. INC.

NAME: RATHERFORD UNIT #18-12 NW HORIZONTAL LATERAL
LEG #2 IN 1-A UPPER POROSITY BENCH, DESERT CREEK

LOCATION: SECTION 18, T41S, R23E

COUNTY/STATE: SAN JUAN, UTAH

ELEVATION: KB:4687' GL:4675'

SPUD DATE: 7/06/97

COMPLETION DATE: 7/13/97

DRILLING ENGINEER: BENNY BRIGGS / SIMON BARRARA

WELLSITE GEOLOGY: DAVE MEADE / MARVIN ROANHORSE

**MUDLOGGING
ENGINEERS:** DAVE MEADE / MARVIN ROANHORSE

CONTRACTOR: BIG "A" RIG 25
TOOLPUSHER: J. DEES

HOLE SIZE: 4 3/4"

CASING RECORD: SIDETRACK IN WINDOW AT 5300' MEASURED DEPTH

DRILLING MUD: M-I
ENGINEER: RON WESTENBERG/ DANNE BEASON
MUD TYPE: FRESH WATER & BRINE WATER W/ POLYMER SWEEPS

**DIRECTIONAL
DRILLING CO:** SPERRY-SUN

ELECTICAL LOGGING: NA

TOTAL DEPTH: 8364' MEASURED DEPTH TVD-5461.52'

STATUS: TOH & LAY DOWN TOOLS

DRILLING CHRONOLOGY
RATHERFORD UNIT #18-12
1-A NW HORIZONTAL LATERAL LEG #2

DATE	DEPTH	DAILY	ACTIVITY
7/07/97	5291'	2'	TOH-PICK UP STARTER MILL-TIH-MILL 5291' TO 5293'-(150 ppm H ₂ S NOTED)-CIR BTMS UP-TOH-LAY DOWN STARTER MILL-PICK UP WINDOW MILL & WATERMELL-TIH-CIR & MILL WINDOW H ₂ S NOTED(30+ppm H ₂ S NOTED)-TOH W/WINDOW MILL- PICK UP STARTER MILL-TIH-CIR & MILL (25ppm H ₂ S NOTED)-TOH W/ STARTER MILL
7/08/97	5293'	7'	TOH-LAY DOWN STARTER MILL-PICK UP WINDOW MILL & WATERMELL-TIH-BREAK CIR. (50ppm H ₂ S NOTED)-MILL 5591'-5300'-CIR BTMS UP-LAY DOWN 16 JTS PIPE & TOH-PICK UP CURVE ASSEMBLY & TEST MWD-TIH-PICK UP SWIVEL-BREAK CIR. (50ppm H ₂ S NOTED)- RIG UP WIRELINE & RUN GYRO-CHECK TOOL FACE
7/09/97	5300'	206'	RUN GYRO-CHECK TOOL FACE & CHECK SHOT SURVEY-TIME DRLG 5300'-5304'-DIR DRLG 5304'-5333'-PULL GYRO & RIG DOWN GYRO DATA WIRE LINE- DIR DRILLING & SURVEYS
7/10/97	5506'	74'	DIR DRILLING & SURVEYS-MUD MOTOR FAILED @ 5569'-LAY DOWN 80 JTS DRL PIPE-TOH-LAY DOWN CURVE ASSEMBLY-RIG REPAIRS-PICK UP LATERAL BHA & BIT #2-TIH-LAY DOWN 20 JNTS PH6 TUBEING- BREAK CIR. (50ppm H ₂ S NOTED)- DIR DRLG & SURVEYS
7/11/97	5580'	805'	DIR DRLG & SURVEYS
7/12/97	6385'	1047'	DIR DRLG & SURVEYS
7/13/97	7432'	932'	DIR DRLG & SURVEYS TD @ 8364'-PUMP SWEEPS & CIR SAMPLES UP-LAY DOWN 5 JNTS WITH SWIVEL-HANG SWIVEL & LAY DOWN 98 JTS DRILL PIPE -TOH TO 5257'-DISPLACE HOLE WITH 10# BRINE
7/14/97	8364'		TOH & PREPARE TO MOVE RIG

DAILY ACTIVITY

Operator: MOBIL

Well Name: RATHERFORD UNIT #18-12 NW 1-A HORIZONTAL LATERAL LEG #2

DATE	DEPTH	DAILY	DATE	DEPTH	DAILY
7/06/97	9124'	31'			
7/07/97	5291	2'			
7/08/97	5293'	7'			
7/09/97	5300'	206'			
7/10/97	5506'	74'			
7/11/97	5580'	805'			
7/12/97	6385'	1047'			
7/13/97	7432'	932'			
TD	8364'				

BIT RECORD

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #18-21 NW 1-A HORIZONTAL LATERAL LEG #2

[illegible]

Customer ... : Mobil
Platform ... : RATH HERFORD UNIT
Slot/Well .. : BA2 1 5/18-12, 2A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
5200	0.57	190.29	5198.47	0.16 S	48.55 W	38.68	0
5291	0.42	169.63	5289.47	0.93 S	48.57 W	38.23	0.25
5300	1.6	290.5	5298.47	0.92 S	48.68 W	38.32	20.57
5320	6.9	295.51	5318.4	0.31 S	50.03 W	39.77	26.54
5340	13.8	296.38	5338.07	1.27 N	53.25 W	43.3	34.51
5360	21.2	296.75	5357.13	3.97 N	58.63 W	49.21	37
5380	28.4	296.96	5375.27	7.75 N	66.11 W	57.46	36
5400	35.2	297.1	5392.26	12.54 N	75.49 W	67.83	34
5420	41.6	292.7	5407.93	17.74 N	86.76 W	79.96	34.78
5440	48.5	294.7	5422.05	23.44 N	99.7 W	93.73	35.21
5460	53	300	5434.71	30.56 N	113.44 W	108.99	30.44
5480	58.8	302.2	5445.92	39.12 N	127.6 W	125.46	30.39
5500	66	302.6	5455.17	48.62 N	142.56 W	143.11	36.04
5520	70	308.4	5462.67	59.39 N	157.64 W	161.63	33.5
5540	74.1	315.7	5468.84	72.13 N	171.74 W	180.57	40.31
5560	80.1	316.4	5473.3	86.16 N	185.26 W	199.81	30.19
5580	82.8	315	5476.28	100.31 N	199.08 W	219.36	15.17
5600	84.4	312.5	5478.51	114.05 N	213.43 W	239.09	14.77
5620	86	310.2	5480.18	127.22 N	228.39 W	258.96	13.98
5640	89.4	309.5	5480.98	140.02 N	243.73 W	278.92	17.36
5657.54	91.9	309	5480.78	151.12 N	257.31 W	296.44	14.54
5688.16	92	308.8	5479.74	170.33 N	281.13 W	327.03	0.73
5719.96	90	308.8	5479.19	190.26 N	305.91 W	358.81	6.29
5751.71	91.3	308.5	5478.83	210.08 N	330.7 W	390.54	4.2
5783.53	89.7	308.3	5478.55	229.85 N	355.64 W	422.35	5.07
5815.27	87.4	308.3	5479.35	249.51 N	380.53 W	454.07	7.25
5846.95	87.2	307.8	5480.84	269.02 N	405.45 W	485.71	1.7
5878.74	88.1	308.5	5482.15	288.64 N	430.43 W	517.46	3.59
5910.35	88.4	308.8	5483.11	308.37 N	455.11 W	549.05	1.34
5942.11	88.9	309	5483.86	328.31 N	479.82 W	580.78	1.7
5973.83	89.2	309.4	5484.39	348.35 N	504.4 W	612.47	1.58
6005.63	89.3	309.5	5484.8	368.56 N	528.95 W	644.24	0.44
6037.4	89.5	309.7	5485.14	388.81 N	553.43 W	675.98	0.89
6069.28	89.6	309.9	5485.39	409.21 N	577.92 W	707.82	0.7
6100.92	90	310.1	5485.5	429.55 N	602.16 W	739.41	1.41
6132.6	89.8	309.2	5485.55	449.77 N	626.55 W	771.06	2.91
6196.18	90.6	308.1	5485.33	489.47 N	676.2 W	834.61	2.14
6258.82	91.6	308.3	5484.13	528.2 N	725.42 W	897.22	1.63

Customer ... : Mobil
 Platform ... : RATH HERFORD UNIT
 Slot/Well .. : BA2 1 5/18-12, 2A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
6322.48	92.5	308.3	5481.85	567.63 N	775.34 W	960.83	1.41
6386.03	92.5	307.8	5479.08	606.77 N	825.34 W	1024.31	0.79
6449.55	92	307.4	5476.59	645.49 N	875.63 W	1087.77	1.01
6512.35	88.6	305.5	5476.26	682.79 N	926.13 W	1150.56	6.2
6575.95	89.7	304.6	5477.2	719.31 N	978.19 W	1214.11	2.23
6639.36	90.8	303.7	5476.92	754.91 N	1030.66 W	1277.44	2.24
6702.95	90.1	302.5	5476.42	789.63 N	1083.93 W	1340.88	2.18
6766.51	89.6	304.1	5476.59	824.53 N	1137.05 W	1404.3	2.64
6830.08	90.3	304.8	5476.65	860.49 N	1189.47 W	1467.81	1.56
6893.73	91.1	305.1	5475.87	896.95 N	1241.64 W	1531.42	1.34
6957.12	90.8	305	5474.82	933.35 N	1293.53 W	1594.76	0.5
7019.76	89.6	304.4	5474.6	969.01 N	1345.03 W	1657.35	2.14
7083.34	90.3	306	5474.65	1005.65 N	1396.98 W	1720.89	2.75
7146.77	91.8	304.8	5473.49	1042.39 N	1448.67 W	1784.29	3.03
7210.46	92.2	305.8	5471.27	1079.17 N	1500.62 W	1847.91	1.69
7274.1	88.2	305	5471.05	1116.03 N	1552.48 W	1911.51	6.41
7337.7	88.7	303.9	5472.77	1151.99 N	1604.91 W	1975.02	1.9
7401.3	89.4	305.1	5473.82	1188.01 N	1657.31 W	2038.55	2.18
7464.89	89.9	306.7	5474.21	1225.3 N	1708.82 W	2102.13	2.64
7528.39	90.1	307.4	5474.21	1263.55 N	1759.5 W	2165.63	1.15
7592.08	90.2	307.4	5474.04	1302.24 N	1810.1 W	2229.31	0.16
7655.52	90.9	307.1	5473.44	1340.64 N	1860.59 W	2292.75	1.2
7719.17	91	309	5472.38	1379.86 N	1910.71 W	2356.38	2.99
7782.69	91.8	308.6	5470.83	1419.65 N	1960.19 W	2419.85	1.41
7846.18	92.1	309	5468.67	1459.41 N	2009.65 W	2483.27	0.79
7909.59	89.9	307.8	5467.56	1498.79 N	2059.33 W	2546.64	3.95
7973.15	88.9	308.3	5468.23	1537.96 N	2109.38 W	2610.19	1.76
8036.72	89.9	308.3	5468.89	1577.36 N	2159.26 W	2673.74	1.57
8100.43	92.4	307.4	5467.61	1616.44 N	2209.55 W	2737.42	4.17
8164.2	92.5	308.1	5464.89	1655.44 N	2259.93 W	2801.13	1.11
8227.91	91.3	306.4	5462.78	1693.98 N	2310.61 W	2864.8	
8290.56	89.6	304.3	5462.28	1730.22 N	2361.7 W	2927.42	3.26
8333	91	304.1	5462.06	1754.08 N	2396.8 W	2969.8	4.31
8364	91	304.1	5461.52	1771.46 N	2422.47 W	3000.76	3.33

MUD REPORT

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #18-21 NW 1-A HORIZONTAL LATERAL LEG #2

DATE	DEPTH	WT	VIS	PLS	YLD	GEL	PH	WL	CK	CHL	CA	SD	OIL	WTR
7/06/97	9124'	8.8	28	2	1	0/0	11.0	28	NC	65000	880	-	4%	96%
7/07/97	5293'	8.8	28	2	1	0/0	11.6	28	NC	110 K	880	-	4%	96%
7/08/97	5293'	8.8	28	2	1	0/0	11.6	28	NC	70000	800	-	4%	96%
7/09/97	5346'	8.8	28	2	1	0/0	11.6	34	NC	58000	800	-	4%	96%
7/10/97	5570'	8.8	28	2	1	0/0	11.6	22	NC	50000	800	-	3%	97%
7/11/97	5787'	8.8	28	2	1	0/0	11.6	32	NC	50000	800	-	4%	96%
7/12/97	6700'	8.6	28	2	1	0/0	9.5	28	NC	58000	3800	-	20%	80%
7/13/97	7776'	8.6	28	2	1	0/0	9.5	N/C	N/C	52000	6800	-	10%	90%

FORMATION TOPS

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #18-12 NW 1-A HORIZONTAL LATERAL LEG #2

[illegible]

GEOLOGICAL SUMMARY

AND

ZONES OF INTEREST

The Mobil Exploration and Production U.S. Inc., Ratherford Unit #18-12 Horizontal Lateral Leg 2 was a re-entry of the Mobil Ratherford Unit #18-12 located in Section 18, T41S, R23E, and was sidetracked in a northwesterly direction from a 5300' measured depth, 5300' true vertical depth, on July 8, 1997. The lateral reached a measured depth of 8364', true vertical depth of 5461' at total depth, with a horizontal displacement of 3001' and true vertical plane 304 degrees, on July 13, 1997, in the upper Desert Creek 1-A porosity zone, where the decision to terminate the lateral was made. The lateral was drilled with only minor problems, which were minor traces of H₂S gas noted while circulating after trips while milling window and drilling the curve section, which was due to the well having been used for injection prior to the lateral being drilled. Another minor problem was the mud motor failing while drilling the curve section. On July 10th, the down hole mud motor failed, with approximately 4' of vertical section remaining above the 1-A porosity zone. At this time the decision was made to change to the lateral assembly. At a measured depth of approximately 6000', the lateral began making water and oil, with the well making 60 bbls per hour of fluid, which decreased as the lateral continued. This lateral used fresh water and then an oil and water emulsion with polymer sweeps as the drilling fluid. A very minor amount of oil was noted while drilling the lateral through the 1-A porosity zone. The background gases noted on the accompanying mud log showed moderate to good increases while drilling the 1-A porosity, and decreased very slightly over the last 1000' of the lateral. The samples showed a fair amount of oil shows through out the drilling of the lateral in the 1-A section.

The primary objectives of the Ratherford Unit #18-21 Leg 1 horizontal lateral was the upper 1-A porosity bench of the Desert Creek, to identify and define the porosity benches, the effective porosity, staining and reservoir properties in 1-A zone of the Desert Creek Member of the Upper Paradox Formation. The lower Upper Ismay, Lower Ismay, Gothic Shale, and the transition zone at the top of the Desert Creek were encountered while drilling the curve section of the lateral. Kick off point for this lateral was 5300', measured and true vertical depth, in the upper half of the Upper Ismay member of the Paradox Formation.

The top of the Upper Ismay was not seen during the drilling of the R.U. 18-21 reentry. The Upper Ismay was predominately light gray to gray brown to medium brown, cryptocrystalline, some microcrystalline, chalky to clean, slightly argillaceous, cherty, occasionally fossiliferous limestone. There were interbedded brown to dark brown, cryptocrystalline to microcrystalline, clean to dense, occasionally earthy, slightly limy dolomites, very thin dark gray brown to black, carbonaceous, slightly calcareous to dolomitic shales, and scattered brown to black to translucent chert fragments noted through out the Upper Ismay. Some very thin, light gray to off white, very limy, argillaceous siltstone and light gray to gray brown, very fine to fine grained, poorly cemented, argillaceous to limy, slightly micaceous sandstone were noted in the upper part of the Upper Ismay seen while drilling. There was no visible to very rare anhydrite and calcite filled fracture porosity noted in the limestones and dolomites of the Upper Ismay, with very rare visible mineral fluorescence and no stain or cut and no significant gas increases. The very dolomitic limestones at the base of the Upper Ismay graded into the very thin, carbonaceous, dolomitic shale of the Hovenweep.

The top of the Lower Ismay was picked at 5436' measured depth, 5419' true vertical depth, at the base of the very thin Hovenweep shale. The Lower Ismay was predominately a cream to white, tan to dark brown limestone, microcrystalline to cryptocrystalline, very rarely very finely crystalline, occasionally silty to sandy, some clean, cherty with a trace of scattered anhydrite crystals. Through out the Lower Ismay were minor amounts of silty and sandy limestone grading to very limy, very fine to fine grained, subangular to rounded, light gray to translucent, very limy sandstone, which graded in to the very sandy limestone. These calcareous to slightly siliceous sands indicated possible slumping feature during the deposition of the Lower Ismay. Predominately no to very rare intercrystalline porosity, with only very poor mineral fluorescence, and no stain or cut was seen in the limestones near the base of the Lower Ismay. Interbedded in the limestones were rare and very thin scattered dark brown dolomites, which were cryptocrystalline to microcrystalline, earthy to clean, with no visible porosity, fluorescence, stain or cut. The dolomitic limestones and very thin dolomites at the base of the Lower Ismay became gray brown, very argillaceous and shaley. These basal limestones and dolomites also became very marly and graded into the Gothic Shale.

The top of the Gothic Shale was at 5506' measured depth, 5458' true vertical depth. The Gothic Shale was predominantly dark gray to black, silty, carbonaceous, brittle to firm, subblocky to blocky to platy, calcareous to slightly dolomitic and slightly micaceous. Scattered within the Gothic were very thin, cryptocrystalline to microcrystalline, earthy, limestones and dolomites, with very rare scattered anhydrite crystals. The top of the Gothic was gradational from the very thin interbedding of very argillaceous, carbonaceous limestone and very argillaceous, limy dolomite, with the dolomite grading into very dolomitic, carbonaceous shale. The top of the Gothic was picked predominantly by the decrease in penetration rate and a distinct increase in the percentage of shale in the samples.

Between the Gothic Shale and Desert Creek Porosity Members is a transitional zone, which appears to be upwardly gradational. The top of the Desert Creek is commonly picked at the Gothic Shale to transition zone facies change, which in this leg occurred at a measured depth of 5547' and a true vertical depth of 5470'. In this well the zone was interbedded a very silty, dolomitic limestone, brown, limy, argillaceous dolomites and very thin carbonaceous shales. The limestones were cream to tan, some gray to white to brown to dark brown, mottled light brown dark brown, cryptocrystalline to microcrystalline, argillaceous, and anhydritic, with scattered anhydrite crystals. The limestones had no visible to very rare, very poor intercrystalline porosity, but only very rare, spotty mineral fluorescence and no visible stain or cut. The interbedded dolomites were microcrystalline to granular, slightly silty and had no to very rare intercrystalline porosity, with no visible sample show. At a measured depth of 5569', the down hole mud motor failed and a trip was made to pick up the lateral assembly, prior to drilling into the 1-A porosity zone. Upon resumption of drilling in the lateral section, the well bore was drilled at a slight downward angle to acquire the porosity of the 1-A and then was attempted to turn toward the projected dip angle.

The transition zone of the Upper Desert Creek graded into the oolitic porosity of the 1-A zone. The top of the Desert Creek 1-A porosity zone was picked at 5514' measured depth, 5479' true vertical depth, with a horizontal displacement of 245'. The pick was based on sample identification as well as a significant increase in the penetration rate. The top in this lateral was in a very oolitic, clean to very slightly dolomitic, slightly anhydritic limestone grainstone, which had very rare scattered chert fragments. Noted in the limestone were thinly interbedded tight, cryptocrystalline, occasionally platy, anhydritic to very slightly dolomitic limestone packstones near the top and scattered in varying amounts as inclusions and fragments through the lateral. The limestone was cream to tan, light brown to occasionally brown, with predominately fair to good intercrystalline to oolitic porosity, some very rare algal porosity. It appears that the 1-A porosity bench is possibly defined by the interval 5479' true vertical depth to approximately 5491' true vertical depth. The top of the porosity bench was marked by a slightly gradational to sharp facies change as the drill rate increased rather rapidly. The base of the porosity zone was approached but tagged during the drilling of the lateral section.

The oolitic limestone porosity of the 1-A zone was continuous through the length of the lateral, from a measured depth of 5506', 5479' true vertical depth, to its termination at a measured depth of 8364', 5461' true vertical depth, with 3001' of horizontal displacement. These limestones were tan to light brown to brown, micro to very finely crystalline, very oolitic to slightly oolitic, occasionally very slightly algal. Through out the zone there were varying amounts of dolomite cement, translucent to buff chert fragments, cryptocrystalline oolitic limestone packstone and anhydrite crystals to inclusions. Scattered anhydrites filled porosities were also noted. As the well bore approached the top and base of the zone an increase in tight, tan to cream to white, cryptocrystalline, very slightly oolitic limestone packstone, with a slight increase in scattered chert fragments, and decreasing porosity, stain, fluorescence and cut was noted. The top of the 1-A zone porosity zone was tagged at measured depths of 5690', 6450', 7220', and 7800', true vertical depths of 5480', 5478.5', 5471', 5470', with horizontal displacements of 330', 1090', 1858', and 2438' respectively. The top of the 1-A porosity zone was scraped up against near the end of the lateral, from measured depths of 7790' to 7815', with a true vertical depth of 5471' and horizontal displacements from 2430' to 2455'. The base of the best porosity was approached only once through out the length of the lateral, near a measured depth of 6150', with true vertical depth of 5485' and had a horizontal displacement of 800'. Although the penetration rate did not reflect the vertical change, or if it did it was a very subtle change in the rate of penetration, in each case a slight decrease in the oolitic and intercrystalline porosity was noted, as well as a slight increase in white to cream, occasionally platy limestone packstone.

The top of the 1-A in the lateral was approximately flat and slowly increased to a dip angle of approximately 90.3 degrees until reaching a horizontal displacement of 2550'. At a horizontal displacement the apparent dip increased to 90.6 degrees.

At a measured depth of 6000' measured depth, 5477' true vertical depth, with 1240' of horizontal displacement, as the well bore approached the R.U. #13-12 well, a water flow of up to 60 bbls of fluid per hour was encountered. There was no noticeable decrease in the sample shown in the good oolitic limestone grainstone was noted. At a measured depth of 6600' as the well path came within approximately 260' of the R.U. #13-12 well. As the lateral was continued, the lithology remained a light brown to tan, cream to white, microcrystalline to very finely crystalline, limestone grainstone with rare scattered cryptocrystalline to platy, very thin, tight limestone packstone. The limestone still were very slightly dolomitic to having rare scattered dolomite rich cement, were very slightly anhydritic. There remained rare scattered translucent to clear chert fragments and translucent to light gray, anhydrite crystals and inclusions noted in the limestone porosity. The limestone grainstones had fair to good intercrystalline to oolitic porosity, with only a trace to fair fluorescence, stain and cut. The platy limestone packstones as the well bumped the top of the porosity zone were very tight and had no visible fluorescence, stain or cut. The background gases showed no measurable decrease after encountering the water flow, but did slightly decrease near the end of the lateral.

At a measured depth of 8364', 5461.5' true vertical depth, and a horizontal displacement of 3001', on July 13, 1997, the lateral was terminated in a very good tan to light brown, cryptocrystalline to very finely crystalline, oolitic to oolitic limestone grainstone, with very rare, slightly oolitic limestone packstones rare scattered chert fragments and some anhydrite crystals and rare porosity filling. Of note was near termination the background gases slightly decreased and sliding became harder. The rate of penetration while rotating began decreasing as the top was encountered and began increasing as the well bore was slid downward and the decision was made at this point to attempt to slide the well bore to completion.

In tracking the well bore through the 1-A bench, the oolitic limestone grainstone porosity was very good and was consistent through out its length. The porosity maintained an apparent thickness of 8' to 10'. In tracking the lateral through out its length, the 1-A top had an over a dip angle of approximately 90.4 degrees, although the dip appeared to be increasing as the well approached the R.U. #13-31 well.

Predominant facies changes were associated with the vertical changes with in the limestones, with no noticeable lateral changes, as the environment of deposition changed when encountering the top or base of the 1-A zone. With the classification changes, the oolitic to oolmoldic limestones encountered were continuous through the 1-A zone penetrated. The effective or the better porosity was associated with the oolitic, to very slightly algal limestone grainstone facies which had fair to good, intercrystalline to oolitic porosities, and the absence of any major anhydrite plugging. The limestone packstone at the top and base of the 1-A zone had no visible porosity and no to very poor permeabilities.

From the top of the 1-A porosity bench to a measured depth of 8364', the limestone lithology was consistent, ranging from light brown to medium brown, cryptocrystalline to very finely crystalline, occasionally microsugrosic to granular, with thin platy limestone packstone and scattered chert fragments, with increases in chert and the limestone packstones as the well bore bumped the top of the 1-A, and approached the 1-A to 1-B transition zone below the 1-A porosity. The limestones had fair to good intercrystalline to oolitic porosity, predominately fair dull to bright yellow fluorescence, with no to a very slight noticeable decrease the top of the zone was approached or scraped. The staining in the limestones ranged from a trace to good light brown to dark brown, and scattered traces of black dead oil stain and the associated cuts being a predominately fair moderately fast to fast streaming cuts, with no to only a very slight decrease noted after encountering the fluid flow of water and oil, near and beyond the #13-12 well. The very thin platy limestones at the top and the base of the 1-A porosity, as well as the scattered fragments with in the porosity of this lateral had no visible porosity, fluorescence, staining, or cut. The sample shows were affected in part due to the oil & water emulsion used as the drilling fluid as well as the minor amounts of oil encountered during the lateral.

The conclusion drawn from the northwesterly lateral in the 1-A zone, is that in this area the limestone porosities were consistent through the zone. Also having an effect on the porosity, was the minor amounts of anhydrite filled porosity and the very thin, platy limestone packstones near the top and base of the 1-A zone. Staining was good to fair and there were sections where staining was poor to a trace, with some black dead oil staining trapped in the intercrystalline porosity. The lateral used the proposed target line as a reference point in the 1-A bench until reaching 350', with the well bore following the best porosity through out the length of the 1-A porosity bench.

While drilling the lateral, the background gas was due to the minor amounts of oil encountered while drilling the lateral as well as the minor amounts of oil added to the mud system. A slight decrease in the background gases was noted in the 1-A zone near the end of the lateral. This lateral can be interpreted to having very good reservoir qualities through out. It appears that the porosities are well enough developed, in this northwesterly direction to enhance the overall performance of the zone.

*The black residual staining has been called by Dr. Dave Eby & others as "bitchimum" and is also known as "dead oil" ("dd o stn" on mud logs). This staining is associated with the movement of oil over long periods of time and is a good indicator of producible hydrocarbons when associated with productive porosities, but can also be found in porosities that have been filled by anhydrites and other material at later dates.

SAMPLE DESCRIPTIONS

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #18-21 NW 1-A/1-B HORIZONTAL LATERAL

DEPTH	LITHOLOGY
5300.00 5310.00	"P-FR SMPL QUALITY, ABNT CMT" "SH m-ltgy,occ dkgy-blk,plty-sbblky,sft-mod sft,slty,tr sl arg strk,sl calc-lmy ip,occ v carb-sl carb,sooty,w/scat LS,wh-crm,occ tan-ltbrn,brn,micxl-crpxl,sl slty,chkyl-sl anhy,tr dkbrn-bf CHT,rr xln ANHY,NFSOC"
5310.00 5320.00	"LS wh,tan-crm,occ brn,crpxl,micxl-vfxl,v chky,pred cln,sl anhy,sl arg/occ tr slty strk,rr mot/dkbrn SH,occ dns,tt,NFSOC"
5320.00 5330.00	"LS AA,tt,NFSOC,v arg,v slty-v sdy,grdg to ltgy v arg lmy SLTST.w/thn intd clr-trnsl,f gr,w srt calc SS,rr scat m-dkbrn crpxl-lmy tt DOL incl,v rr trnsl-bf CHT frag"
5330.00 5340.00	"LS AA,w/ltgy-crm,v sdy,v lmy,arg,mica SLTST & intbd ltbf-crl-trnsl vf-f gr sbang v lmy arg-v sl mica tt SS"
5340.00 5350.00	"LS tan-brn,crm-wh-ltgy,crpxl,micxl ip,occ chk-sl slty-v sl sdy,cln-dns,trnsl CHT frag,anhy ip,tt,NFSOC,w/v rr scat SLTST-SS AA"
5349.00 5360.00	"LS tan-brn-crm-wh,crpxl,rr micxl,cln-dns,rthy-chk ip,v sl chty,occ sl arg,v sl dol,w/v rr thn blk carb SH lams & bf CHT frag,tt,NFSOC"
5360.00 5370.00	"LS AA,v sl slty,tt,NFSOC,w/intbd brn-mbrn,crpxl-micxl,cln-rthy,v sl lmy,occ chty,tt DOL,NFSOC & SH-CHT AA"
5370.00 5380.00	"LS AA,crpxl,dns,sl dol,tt,NFSOC;DOL lt-mbrn,crpxl,v rr micxl,dns,sl arg,tt,NFSOC;CHT brn-smky gybrn-blk"
5380.00 5390.00	"LS tan-brn,occ wh-crm-ltgy,crpxl-micxl,cln,occ rthy-chk,arg-sl slty,v sl dol,anhy ip,tt,n-v rr mnrl FLOR,NSOC,w/intbd DOL AA,v mrlly ip,occ grdg to dol MRLST,rr ANHY fl frac POR,NFSOC,CHT AA,v rr thn blk carb SH lams"
5390.00 5400.00	"LS AA,v rr scat CALC fl frac,decr DOL,scat dkbrn-brn-blk CHT frag & thn blk carb sl dol-calc SH LAMS,NFSOC"
5399.00 5410.00	"LS crm-tan-brn,occ gybrn,crpxl-micxl,dns-chk,tt,NFSOC,w/intbd blk,carb,sl dol-calc SH & dkbrn-brn dns tt DOL AA,tr smky gybrn-brn-blk CHT frag"
5410.00 5420.00	"LS & DOL AA,NFSOC,grdg to & intbd w/dkgybrn-blk sbblky-spplty mica calc-dol carb SH,rr scat CHT frag AA"
5420.00 5430.00	"DOL lt-dkbrn,occ gybrn,mot ip,crpxl-micxl,rthy-arg,calc,shy ip,scat brn-blk-gybrn CHT frag,grdg to v dol arg tan crpxl-micxl LS,n-v rr intxl POR,n-v rr dull mnrl FLOR,NSOC,w/v rr thn SH lams AA"
5430.00 5440.00	"ANHY wh-trnsl,frm-mod frm,xln-vfxl,occ chky,intbd in LS AA"

DEPTH	LITHOLOGY
5440.00 5450.00	"LS lt-mgy,ltgybrn,occ brn-tan,dk-ltbrn,micxl-vfxl-crpxl,dns,slty/tr chky sl anhy prtgs,occ dns,sl dol,tr brn-milky CHT,verr fos incl,tt-rr intxl POR/tr chky fl,tr dull yel-orngyel FLOR,n vis STN or CUT "
5450.00 5460.00	"LS AA,incr slty-rr sdy strk,grdg to calc-lmy SS,POR-FLOR-STN-CUT AA,w/SS lt-mgy,trnsl.occ ltgybrn,vfgr,rd,wsrt,wcmr/calc-lmy cmt,tr arg-cly mtx & pp LS incl,scat mlky-trnsl sil-CHT frag,rr pp mica,tt,v fnt dull orng-yelormg FLOR,NSOC"
5460.00 5470.00	"LS/SS AA,POR-FLOR-STN-CUT AA"
5470.00 5480.00	"LS AA,micxl-vfxl,crpxl,slty-sl sdy ip,cln,dns,grdg to slty-vfgr calc-lmy SS ip,rr QTZ-sil nod incl,tt-rr intxl POR,tr v dull yel FLOR,NSOC"
5480.00 5490.00	"DOL mbrn,occ dkbrn-brnblk,crpxl-micxl,rthy,shy-sl arg,sl calc,grdg to v dol SLTST,tr scat ANHY & CHT AA,n-v rr intxl POR,tr dull yel FLOR,rr dkbrn STN,fr v slow strmg CUT"
5490.00 5500.00	"LS ltgy-wh-crm,occ tan-lt-mbrn,crpxl-micxl,vfxl,cln,chky-dns,sl anhy,sl slty/rr sdy incl,tr xln ANHY,occ grdg to slty-vfgr calc-lmy SS,tt-rr intxl POR,tr-rr scat dull yel FLOR,rr brn STN,p dif/sl tr slow strmg CUT"
5500.00 5510.00	"SH dkbrnblk-blk,sbblky-sbplty,frm-sft,slty ip,calc,sl-v carb,sooty"
5510.00 5520.00	"DOL AA,crpxl-micxl,rthy,shy-sl arg,sl calc,occ grdg to v dol SLTST,rr scat ANHY & CHT AA,n-v rr intxl POR,tr dull yel FLOR,rr dkbrn STN,tr v slow strmg CUT"
5520.00 5530.00	"LS AA,crpxl-micxl,vfxl,cln-mot/blk SH,chky-dns,sl anhy,sl slty,tr xln ANHY,tt-rr intxl POR,tr-rr scat dull yel FLOR,rr brn STN,p dif/sl tr slow strmg CUT"
5530.00 5540.00	"SH blk-dkgybrn,carb,sooty,AA,w/thn wh-brn crpxl LS & v thn dkbrn-gybrn crpxl DOL incl-lams,scat wh-trnsl ANHY xl"
5540.00 5550.00	"SH AA,incr & grdg to v arg,brn-dkgybrn,micxl-crpxl,lmy,v sl anhy,shy,tt DOL,NFSOC & thn wh-brn-ltgy,micxl-crpxl,slty,arg,sl dol,tt LS,NFSOC"
5550.00 5560.00	"SH AA,lt-dkgybrn-brn,micxl DOL,rthy,v sl anhy,slty,lmy,tt-v rr intxl POR,n-v rr fnt dull yel FLOR,n vis STN,n-v p slow dif CUT,w/thn LS AA,NFSOC,v rr ANHY xl-bf CHT frag"
5560.00 5569.00	"LS lt-dkbrn,mot,occ crm,crpxl-micxl,rthy-v sl slty,chk,sl anhy-rr ANHY xl,dol,arg ip,tt-v rr intxl POR,v rr spty dull yel FLOR,n vis STN,n-v p slow dif CUT,w/DOL AA,v rr SH lams AA"
5569.00 5590.00	"LS tan,ltgy,crm-wh,occbrn,crpxl,micxl-occ vfxl,pred dns PCKST/thn intbd GRNST prtgs,chky-sl anhy,tr scat tan-trnsl CHT frag,rr xln ANHY,tt-rr intxl POR,tr scat dull-mod bri yel FLOR,n-rr brn STN,g dif/tr slow strmg CUT"
5590.00 5620.00	"LS tan,crm-wh,occ brn,crpxl-micxl,occ vfxl-gran,pred LS PCKST,tr scat GRNST frag,cln,chky,plty-dns,sl anhy-occ arg,tr trnsl xl ANHY,tr be-trnsl CHT frag,tt-tr intxl POR/vrr frac POR,fr-tr dull/tr-rr scat mod bri-bri yel FLOR,fr dif/tr res ring CUT"
5620.00 5640.00	"LS tan-ltbrn-ltgybrn,crpxl-vfxl,gran,occ dns,pred oolitic LS GRNST,w/thn tt LS PKST,rr anhy-ANHY xl,styl ip,tt-g ool-intxl POR,tr bri-dull yel FLOR,fr-ltbrn STN,rr blk dd o STN,fr-g mod fast-fast strmg CUT"

DEPTH	LITHOLOGY
5640.00 5650.00	"LS AA,incr LS PKST,scat Gast fos,decr ool-intxl POR,NFSOC AA"
5650.00 5670.00	"LS tan-ltbrn,wh-crm-ltgy ip,crpxl-micxl,occ vfxl-gran,micsuc ip,pred v sl ool tt LS PKST,intbd oolcastic-oolmoldic LS GRNST-incr w/depth,scat trnsL CHT frag,rr ANHY xl-sl anhy,tt-g ool-intxl POR,fr bri-dull yel FLOR,tr-fr ltbrn-tr blk STN,fr-g fast CUT"
5670.00 5690.00	"LS tan-ltbrn,occ crm-ltgybrn,micxl-vfxl,occ crpxl,gran-misuc,occ tt,pred oolcastic-oolmoldic LS GRNST,thn intbd tt sl ool LS PKST,scat ANHY xl-trnsL CHT frag,fr-g ool-intxl POR,fr-mod g dull-bri yel FLOR,tr-fr ltbrn-brn STN,tr dd o STN,fr-g mod fast CUT"
5690.00 5700.00	"LS AA,sl incr tt ool LS PKST,v sl DOL cmt,decr POR-STN,FLOR & CUT AA"
5700.00 5720.00	"LS tan-ltbrn-ltgybrn,crpxl-vfxl,gran-micsuc,occ dns,pred oolcastic LS GRNST,w/thn tt wh-crm plty LS PKST,rr anhy-ANHY xl,scat trnsL CHT frag,fr-g ool-intxl POR,fr-g bri-dull yel FLOR,fr ltbrn STN,rr-tr blk dd o STN,fr-g mod fast-fast stmg CUT"
5720.00 5730.00	"LS AA,pred oolcastic-oolmoldic LS GRNST,v thn tan occ wh-crm-ltgy some plty LS PKST,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr-fr brn-rr blk STN,fr-g mod fast-fast stmg CUT"
5730.00 5750.00	"LS tan-ltbrn,occ brn,rr wh-crm,miclx-vfxl,gran-micsuc,rr crpxl-dns,pred ooc-oolmoldic LS GRNST,rr intbd plty LS PKST,sl DOL rich cmt,v sl anhy-v rr CHT frag,fr-g intxl-ool POR,fr-g dull-bri yel FLOR,fr-fr ltbrn-tr blk STN,fr-g mod fast-fast stmg CUT"
5750.00 5760.00	"LS AA,sl incr tt ool LS PKST,scat ANHY xl-tr sl CHT frag,POR-FLOR-STN-CUT AA"
5760.00 5770.00	"LS AA,pred oolcastic-oolmoldic LS GRNST,scat ANHY xl-v rr CHT frag,fr-g POR-FLOR-STN-CUT AA"
5770.00 5780.00	"LS tan-ltbrn-brn,crpxl-vfxl,tt-gran,occ micsuc,v sl anhy-rr ANHY xl,scat CHT frag,intbd LS GRNST-LS PKST,v sl dol,tt-g intxl-tr ool POR,fr-g dull-bri yel FLOR,fr-fr ltbrn STN,scat blk dd o STN,g slow-mod fast-fast stmg CUT"
5790.00 5800.00	"LS AA,incr oolcastic-oolmoldic LS GRNST,decr LS PKST,scat trnsL CHT frag,occ DOL rich cmt,fr-g intxl-ool POR,FLOR-STN-CUT AA"
5800.00 5820.00	"LS tan-ltbrn-brn,occ wh-crm,micxl-vfxl,occ crpxl,micsuc-gran,oolcastic-oolmoldic,pred GRNST,w/thn occ plty LS PKST,sl dol,anhy ip,scat trnsL ANHY xl,fr-g ool-fr intxl POR,fr-g bri-dull yel FLOR,fr brn STN-tr blk dd o STN,fr-g slow-fr fast stmg CUT"
5820.00 5830.00	"LS AA,abnt oolcastic-oolmoldic,POR-FLOR-CUT AA,fr ltbrn-brn STN-tr-fr blk dd o STN"
5830.00 5850.00	"LS AA,pred v oolcastic-oolmoldic LS GRNST,scat trnsL-bf CHT frag,rr ANHY xl-incl,v rr plty LS PKST incl,fr-g ool-intxl POR,fr-g dull-bri yel FLOR,fr brn-ltbrn STN,rr-tr blk dd o STN,fr-g mod fast-fast stmg CUT"
5850.00 5860.00	"LS AA,sl decr intxl-ool POR,FLOR-STN-CUT AA"
5860.00 5880.00	"LS tan-ltbrn-brn,crpxl-vfxl,tt-gran,occ micsuc,v sl anhy-rr ANHY xl,scat CHT frag,intbd LS GRNST-LS PKST,v sl dol,tt-g intxl-tr ool POR,fr-g dull-bri yel FLOR,fr-fr ltbrn STN,scat blk dd o STN,g slow-mod fast-fast stmg CUT"

DEPTH	LITHOLOGY
5880.00 5890.00	"LS AA,decr tt plty PKST,g intxl-ool POR,FLOR-STN-CUT AA"
5890.00 5920.00	"LS tan-ltbrn-brn,occ wh-crm,micxl-vfxl,occ crpxl,micsuc-gran,oolicastic-oolmoldic,pred GRNST,w/thn occ plty LS PKST,sl dol,anhy ip,scat trnsi ANHY xl,fr-g ool-fr intxl POR,fr-g bri-dull yel FLOR,fr-g brn STN-tr blk dd o STN,fr-g mod fast-fast strmg CUT"
5920.00 5940.00	"LS AA,sl incr clr-trnsi-bf CHT frag,POR-FLOR-STN-CUT"
5940.00 5970.00	"LS tan-ltbrn-brn,occ wh-crm,micxl-vfxl,occ crpxl,micsuc-gran,oolicastic-oolmoldic,pred GRNST,rr occ plty tt LS PKST incl,sl dol,anhy ip,scat trnsi CHT frag,fr-g ool-intxl POR,fr-g bri-dull yel FLOR,fr-g brn STN-tr blk dd o STN,fr-g mod fast-fast strmg CUT"
5970.00 6000.00	"LS AA,pred v oolicastic-sl oolmoldic LS GRNST,w/rr scat tt-sl ool LS PKST incl,v sl DOL rich cmt,rr scat trnsi-bf CHT frag,v rr ANHY xl-incl,g ool-intxl POR,g FLOR-STN-CUT"
6000.00 6030.00	"LS tan-ltbrn-brn,occ wh-crm,micxl-vfxl,occ crpxl,micsuc-gran,oolicastic-oolmoldic,pred GRNST,rr occ plty tt LS PKST incl,sl dol,anhy ip,scat trnsi CHT frag,fr-g ool-intxl POR,fr-g bri-dull yel FLOR,fr-g brn STN-tr blk dd o STN,fr-g mod fast-fast strmg CUT"
6030.00 6060.00	"LS pred tan-ltbrn-crm,incr brn,occ wh,ooliclastic-oolmoldic,crpxl-gran-vfxl,occ GRNST,sl-occ v chky,v sl dol & anhy,rr xl ANHY & CHT frag,g ooliclastic-tr intxl POR,g even mod bri/scat bri yel FLOR,g brn/scat blk dd o STN,g fast-mod fast strmg mlky CUT"
6060.00 6090.00	"LS tan-ltbrn-crm,decr brn,occ wh,ooliclastic-oolmoldic,crpxl-gran-vfxl,occ GRNST,sl-mod chky,v sl anhy,vrr xl ANHY/rr CHT frag,g ooliclastic-tr intxl POR/rr fl,g even mod bri/scat bri yel FLOR,fr ltbrn-tr brn/tr scat blk dd o STN,g dif/tr slow strmg CUT"
6090.00 6110.00	"LS tan-crm,ltbrn-incr brn,ooliclastic-crpxl,gran-vfxl,occ micxl-oolmoldic,occ GRNST,cln-sl chky,rr-tr scat dns PCKST frag-incl,rr trnsi xl ANHY,vrr trnsi-wh CHT frag,g ooc/tr intxl POR,g even mod bri-bri yel FLOR,g dif/tr mod fast strmg mlky CUT"
6110.00 6130.00	"LS tan-crm,lt-mbrn,occ dkbrn,ooliclastic-crpxl,gran-vfxl,occ GRNST,sl chky/tr POR fl,dol-sl dol,sl anhy,rr ool,rr scat dns PCKST,tr brn CHT incl,fr-g ooc-intxl POR,g even bri-mod bri yel FLOR,g brn/tr scat blk dd o STN,g mod fast-blooming mlky CUT"
6130.00 6160.00	"LS AA,ooliclastic-crpxl,gran-vfxl,occ oolmoldic,ooliclastic GRNST,sl chky,rr POR fl,tr dol cmt-dol ip,sl anhy,rr scat dns PCKST,tr tan CHT incl,g ooc-tr intxl POR,g even bri-mod bri yel FLOR,g brn/tr scat blk dd o STN,g mod fast-blooming mlky CUT "
6160.00 6190.00	"LS tan,lt-mbrn,occ dkbrn,crm,occ-crpxl,gran-vfxl,occ GRNST/tr dol cmt,sl chky-anhy,rr ool,rr scat dns PCKST,tr tan CHT incl,g ooclastic-intxl POR/vrr chky fl,g even mod bri-bri yel FLOR,g brn-dkbrn/tr scat blk dd o STN,g mod fast-slow strmg mlky CUT"
6190.00 6210.00	"LS tan-lt-mbrn,occ dkbrn,crm,ooliclastic-crpxl,gran-vfxl,occ GRNST/dol cmt,sl chky-sl anhy,rr-tr ltgybrn scat PCKST,tr tan-crm CHT incl,g ooliclastic-intxl POR,g even bri-mod bri yel FLOR,g brn/tr scat blk dd o STN,g mod fast strmg mlky CUT "
6210.00 6220.00	"LS AA,ooliclastic GRNST/dol cmt,sl chky,rr chky POR fl,v sl anhy,rr scat PCKST,tr tan-crm CHT incl,g ooc-tr intxl POR,FLOR-STN AA,g slow strmg mlky CUT"

DEPTH	LITHOLOGY
6220.00 6250.00	"LS tan-ltbrn-crm,decr brn,occ wh,ooliclastic-oolmoldic,crpxl-gran-vfxl,occ GRNST/dol cmt,v sl chky-anhy,vrr xl ANHY,tr trnsf-bf CHT frag,g ooc-tr intxl POR,g even mod bri-bri yel FLOR,fr ltbrn-occ brn/tr scat blk dd o STN,g dif/slow strmg mlky CUT"
6250.00 6270.00	"LS ltbrn-tan-crm,occ brn,ooliclastic,crpxl-gran-vfxl,occ oolmoldic,ooliclastic GRNST/dol cmt,sl chky,tr scat PCKST frag-incl,vrr trnsf xl ANHY & trnsf-wh CHT frag,g ooc/tr intxl POR/rr chky fl,FLOR & STN AA,g fast strmg-blooming mlky CUT"
6270.00 6300.00	"LS AA,pred ooliclastic GRNST/dol cmt,tr scat oolmoldic/chky POR fl,rr scat ltgy chky PCKST prtgs,rr bf-crm CHT incl,vrr xl ANHY incl,g ooliclastic-tr intxl POR,g even mod bri-bri yel FLOR,g brn-ltbrn/tr scat blk dd o STN,g fast-blooming mlky strmg CUT"
6300.00 6320.00	"LS ltbrn-tan-crm,incr brn,ooliclastic,crpxl-gran-vfxl,occ oolmoldic,ooliclastic GRNST/dol cmt,sl chky,tr scat PCKST frag-incl,vrr trnsf xl ANHY & trnsf-wh CHT frag,g ooc/tr intxl POR/vrr chky fl,FLOR & STNAA,g slow-mod fast strmg mlky CUT"
6320.00 6350.00	"LS tan-lt-mbrn,occ dkbrn,crm-wh,ooliclastic,crpxl-gran,ooliclastic GRNST/dol cmt,sl chky-v sl anhy,rr-tr scat PCKST,tr tan-crm CHT incl,g oolclastic-intxl POR,g even bri-mod bri yel FLOR,g brn/tr scat blk dd o STN,g fast-mod fast strmg mlky CUT"
6350.00 6380.00	"LS AA,pred ooliclastic GRNST/dol cmt,tr scat oolmoldic/chky POR fl,rr scat chky PCKST prtgs,rr bf-crm CHT incl,vrr xl ANHY incl,g ooliclastic-tr intxl POR,g even mod bri-bri yel FLOR,g brn-ltbrn/tr scat blk dd o STN,g mod fast-slow strmg mlky CUT"
6380.00 6400.00	"LS tan-lt-mbrn,occ dkbrn,crm-wh,ooliclastic,crpxl-gran,ooliclastic GRNST/dol cmt,sl chky-v sl anhy,rr-tr scat PCKST,tr tan-crm CHT incl,g oolclastic-intxl POR,g even bri-mod bri yel FLOR,g brn/tr scat blk dd o STN,g fast-mod fast strmg mlky CUT"
6400.00 6430.00	"LS AA,pred ooliclastic GRNST/dol cmt,tr scat oolmoldic/chky POR fl,rr scat chky PCKST prtgs,rr bf-crm CHT incl,vrr xl ANHY incl,g ooliclastic-tr intxl POR,g even mod bri-bri yel FLOR,g ltbrn/decr brn & blk STN,g mod fast-blooming mlky CUT"
6430.00 6450.00	"LS ltbrn-tan-crm,decr brn,ooliclastic,crpxl-gran-vfxl,occ oolmoldic,ooliclastic GRNST/tr dol cmt,sl chky,tr scat PCKST frag-incl,vrr trnsf xl ANHY & trnsf-wh CHT frag,g ooc/tr intxl POR/vrr chky fl,g even mod bri-bri yel FLOR,STN AA,g fast strmg CUT"
6460.00 6480.00	"LS ltbrn-tan-crm,occ brn,ooliclastic,crpxl-gran-vfxl,occ sl oolmoldic,ooliclastic GRNST/sl dol cmt,sl chky,tr scat PCKST frag-incl,vrr trnsf xl ANHY & trnsf-wh CHT frag,g ooc/tr intxl POR/vrr chky fl,FLOR & STN AA,g slow-mod fast strmg mlky CUT"
6480.00 6500.00	"LS AA,pred ooliclastic-oolmoldic GRNST,tt v sl ool LS PKST,scat ANHY xl-incl,fr-g ool-intxl POR,g dull-bri yel FLOR,g brn STN,rr blk dd o STN,g mod fast-fast strmg CUT"
6500.00 6550.00	"LS tan-brn,v rr crm-ltgybrn,micxl-vfxl,crpxl ip,micsuc-gran,pred ooliclastic-oolmoldic GRNST,thn tt ool LS PKST incl,sl anhy,v sl dol,rr trnsf-bf CHT frag w/ool,tr-g ooli-fr intxl POR,fr-g dull-bri yel FLOR,fr-g brn-ltbrn STN,rr-tr blk dd o STN,g fast CUT"
6550.00 6570.00	"LS AA,decr tt ool LS PKST,g ool-intxl POR,g FLOR-STN-CUT AA"

DEPTH	LITHOLOGY
6570.00 6600.00	"LS tan-brn,rr crm-ltgybrn,micxl-vfxl,crpxl ip,micsuc-gran,pred oolitic-oolmoldic GRNST,rr thn tt ool LS PKST incl,sl anhy,v sl dol,v rr trnsf-bf CHT frag w/ool,tr-g ooli-fr intxl POR,fr-g dull-bri yel FLOR,fr-g brn-ltbrn STN,tr blk dd o STN,g fast CUT"
6600.00 6620.00	"LS tan-brn,v rr crm-ltgybrn,micxl-vfxl,micsuc-gran,pred oolitic-oolmoldic GRNST,thn tt ool crpxl LS PKST incl,rr ANHY xl,sl dol,v rr trnsf-bf ool CHT frag,tr-g ooli-fr intxl POR,fr-g dull-bri yel FLOR,fr-g brn-ltbrn STN,rr-tr blk dd o STN,g fast CUT"
6620.00 6640.00	"LS AA,sl decr ool POR,v sl incr tt ool PKST,sl decr ltbrn-brn-incr blk STN,FLOR-CUT AA"
6640.00 6650.00	"LS tan-ltbrn,crpxl-micxl,occ vfxl-gran,micsuc ip,intbd v oolitic-oolmoldic LS GRNST & PKST,scat ANHY xl-incl,v rr trnsf CHT frag,tr-fr intxl-fr ool POR,fr-g dull-bri yel FLOR,fr dkbrn-blk-tr brn STN,fr-g slow-fast stmg CUT"
6650.00 6670.00	"LS tan-ltbrn-ltgybrn,micxl-vfxl,gran-micsuc,pred oolitic LS GRNST,w/thn tt-dns sl ool LS PKST,rr anhy-ANHY xl,scat trnsf CHT frag,occ DOL rich cmt,fr-g ool-tr intxl POR,fr-g bri-dull yel FLOR,fr-ltbrn STN,fr blk dd o STN,fr-g mod fast-fast stmg CUT"
6670.00 6690.00	"LS AA,w/scat sl ool tt dns LS PKST incl-frag,rr ANHY xl-incl,v rr scat trnsf-bf CHT frag,g ool-tr intxl POR,g dull-bri yel FLOR,fr-fr ltbrn-brn STN,rr-tr blk dd o STN,fr-g mod fast dif-fast stmg CUT"
6690.00 6700.00	"LS AA,incr v ool LS PKST w/depth,sl decr intxl POR,FLOR-STN-CUT AA"
6700.00 6720.00	"LS tan-ltbrn,occ brn,v rr crm,crpxl-vfxl,occ gran-micsuc,pred v ool LS GRNST w/intbd ool LS PKST,v sl dol,sl anhy-rr ANHY xl-trnsf-bf CHT frag,fr-g ool-tr-fr intxl POR,fr-g dull-bri yel FLOR,fr-fr brn-rr blk STN,fr-g mod fast dif-fr fast stmg CUT"
6720.00 6740.00	"LS AA,incr ANHY xl-incl,rr scat trnsf-bf CHT frag,fr-g ool-tr-fr intxl POR,fr-g bri-dull yel FLOR,STN-CUT AA"
6740.00 6750.00	"LS tan-ltbrn-brn,crpxl-vfxl,tt-gran,occ micsuc,sl anhy-tr ANHY xl,scat CHT frag,intbd LS GRNST-LS PKST,occ DOL rich cmt,tt-g intxl-tr ool POR,fr-g dull-bri yel FLOR,fr-fr ltbrn STN,scat blk dd o STN,g mod fast dif-fr fast stmg CUT"
6750.00 6770.00	"LS AA,pred v ool GRNST,v rr v thn LS PKST,g ool-tr-fr intxl POR,g FLOR-STN-CUT"
6770.00 6790.00	"LS tan-brn-ltbrn,crpxl-vfxl,dns-gran,micsuc ip,tt oolitic LS PKST bcmg oolitic-oolmoldic LS GRNS,scat ANHY xl-incl,v rr scat trnsf-bf ool CHT frag,g ool-fr intxl POR,g bri-dull yel FLOR,fr ltbrn-brn-tr blk STN,fr-g fast dif-fr fast stmg CUT"
6790.00 6820.00	"LS tan-ltbrn-brn,crpxl-vfxl,gran,occ micsuc,sl anhy-tr ANHY xl,v rr scat trnsf ool CHT frag,intbd LS GRNST-LS PKST,occ DOL rich cmt,tr-g intxl-g ool POR,g dull-bri yel FLOR,fr ltbrn STN,scat tr blk dd o STN,g mod fast dif-fr fast stmg CUT"
6820.00 6840.00	"LS AA,pred v oolitic-oolmoldic LS GRNST & thn LS PKST,fr-g ool-intxl POR,g bri-dull yel FLOR,fr-fr ltbrn-brn STN,tr blk dd o STN,fr-g fast dif-fast stmg CUT"
6840.00 6860.00	"LS AA,w/v thn tt-v ool LS PKST incl-frag-occ intbd,g POR-FLOR-STN-CUT"

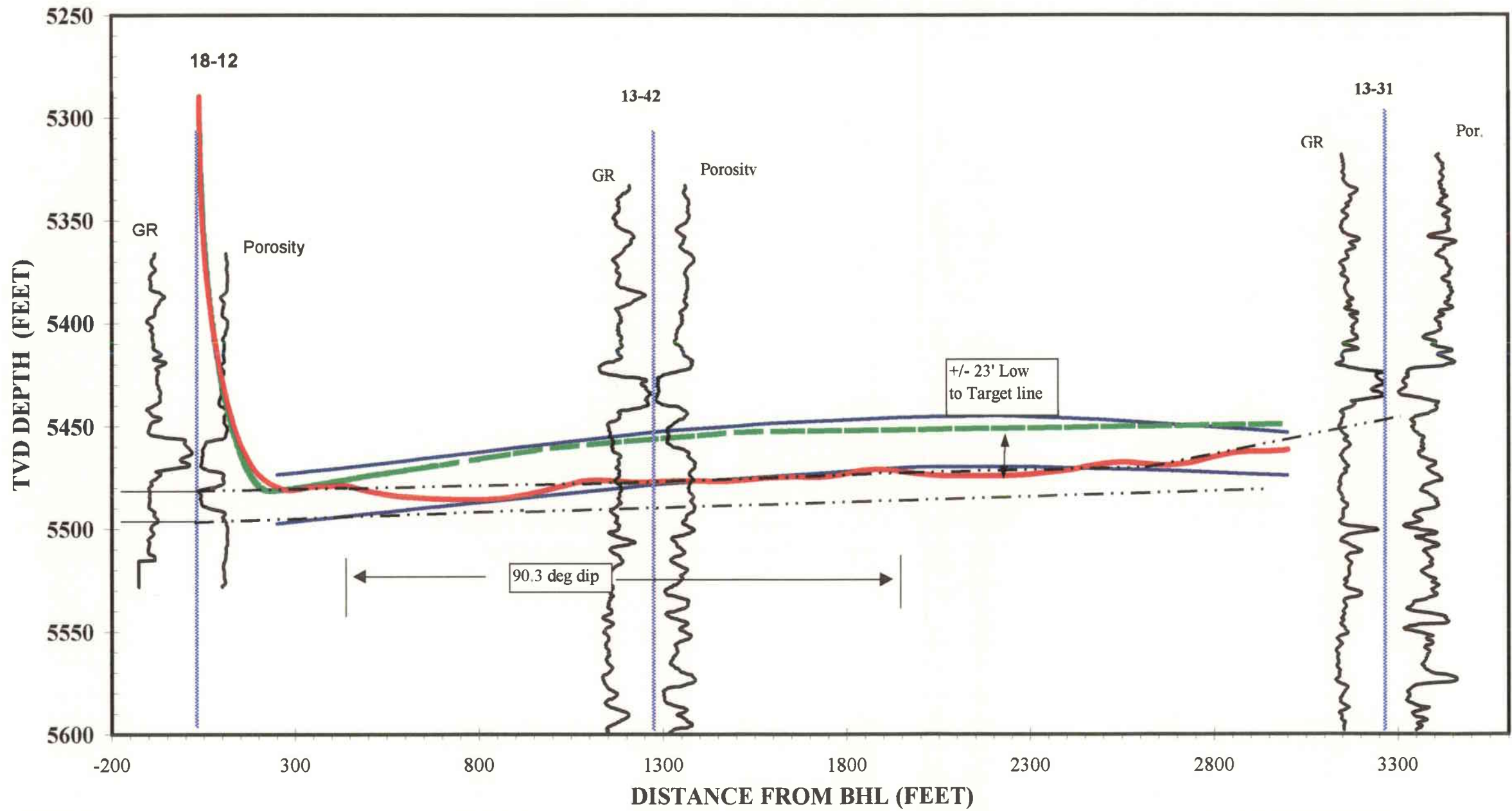
DEPTH	LITHOLOGY
6860.00 6880.00	"LS tan-brn-ltbrn,rr gybrn,crpxl-vfxl,gran-micsuc,rr suc,dns ip,v oolcastic-oolmoldic LS GRNST w/rr thn tt ool LS PKST,v rr ANHY xl & v rr scat wh-bf CHT frag,g ool-fr intxl POR,g dull-bri yel FLOR,g brn STN,tr blk dd o STN,g fast dif-stmg CUT"
6880.00 6900.00	"LS AA,POR-FLOR-STN-CUT AA"
6900.00 6910.00	"LS AA,pred v oolcastic-oolmoldic LS PKST,w/g ool-intxl POR,g FLOR-STN-CUT AA"
6910.00 6940.00	"LS tan-ltbrn-brn,micxl-vfxl,crpxl ip,micsuc-gran,pred oolcastic-oolmoldic GRNST,rr thn tt ool LS PKST incl,sl anhy,v sl dol,v rr trns CHT frag w/ool,g ooli-tr-fr intxl POR,g dull-bri yel FLOR,fr-g brn-ltbrn STN,tr blk dd o STN,g fast dif-fast stmg CUT"
6940.00 6960.00	"LS ltbrn-brn,occ tan,crpxl-vfxl,dns-gran,micsuc ip,v oolcastic-oolmoldic,intbd LS GRNST-PKST,scat ANHY xl-incl,v rr scat trns-l-wh-bf v sl ool CHT frag,g ool-tr-fr intxl POR,g bri-dull yel FLOR,fr-fr brn STN,tr blk dd o STN,fr-g fast dif-fast stmg CUT"
6960.00 7000.00	"LS tan-ltbrn-brn,micxl-vfxl,crpxl ip,micsuc-gran,pred oolcastic-oolmoldic GRNST,rr thn tt ool LS PKST incl,sl anhy,v sl dol,rr trns-l-wh CHT frag w/ool,g ooli-tr-fr intxl POR,g dull-bri yel FLOR,fr-g brn-ltbrn STN,tr blk dd o STN,g fast dif-fast stmg CUT"
7000.00 7020.00	"LS tan-ltbrn-brn,micxl-vfxl,crpxl ip,micsuc-gran,pred oolcastic-oolmoldic GRNST,rr thn tt ool LS PKST incl,sl anhy,v sl dol,v rr trns CHT frag w/ool,g ooli-tr-fr intxl POR,g dull-bri yel FLOR,fr-g brn-ltbrn STN,tr blk dd o STN,g fast dif-fast stmg CUT"
7020.00 7050.00	"LS AA,w/v sl decr in ool POR,decr tt LS PKST,fr-g intxl-g ool POR,g dull-bri yel FLOR,fr-g brn STN,tr blk dd o STN,g fast dif-fast stmg CUT"
7050.00 7060.00	"LS ltbrn-brn,tan,rr wh,micxl-vfxl,gran-suc,crpxl-dns ip,v sl chty-rr CHT frag,occ sl anhy-rr xl,sl DOL rich cmt,rr dns LS PKST-v ool-tt,g intxl-ool POR,g bri-dull yel FLOR,fr-g brn-rr spty blk STN,g fast stmg CUT"
7060.00 7080.00	"LS tan-brn-ltbrn,rr gybrn,crpxl-vfxl,gran-micsuc,rr suc,dns ip,v oolcastic-oolmoldic LS GRNST w/rr thn tt ool LS PKST,v rr ANHY xl & v rr scat wh-bf CHT frag,g ool-fr intxl POR,g dull-bri yel FLOR,g brn STN,tr blk dd o STN,g fast dif-stmg CUT"
7080.00 7090.00	"LS AA,v sl incr LS PKST,v sl decr ool POR,FLOR-STN-CUT AA"
7090.00 7100.00	"LS AA,incr tt chty ool LS PKST,rr wh-trns CHT frag,rr-g intxl-ool POR,g bri yel FLOR,fr-g ltbrn-brn STN,rr-tr spty blk dd o STN,g fast CUT"
7100.00 7120.00	"LS tan-crm,occ ltbrn,off wh,ooliclastic,crpxl-micxl,vfxl-gran,occ oolmoldic,ool GRNST/tr dol cmt,PCKST AA,sl-occ v chky,rr-tr trns-l-milky CHT frag,vrr xl ANHY,g intxl-ool POR/tr chk fl,g bri-dull yel FLOR,g ltbrn/tr brn & blk STN,g mod fast strmg milky CUT"
7120.00 7150.00	"LS AA,pred GRNST/tr dol cmt,sl incr dns PCKST,sl chky,sl anhy/rr xl ANHY frag,rr CHT frag AA,vrr ool incl,g intxl-ooliclastic POR,g even mod bribri yel FLOR,g-fr ltbrn/tr scat brn STN,tr blk pp dd o STN,g mod fast strmg milky CUT"
7150.00 7180.00	"LS tan-crm,ltbrn,occ wh,ooliclastic-crpxl-micsuc,vfxl-gran,ool GRNST/tr dol cmt,scat dns PCKST,sl chky,v sl anhy-rr trns xl ANHY frag,vrr trns CHT frag,g intxl-ool POR,g mod bri-bri yel FLOR,g ltbrn/scat brn & blk pp dd o STN,g mod fast-slow strmg CUT"

DEPTH	LITHOLOGY
7180.00 7200.00	"LS AA,ooliticlastic-micsuc-vfxl,gran-crpxl,occ oolmoldic,ooliticlastic GRNST/dol cmt,tr scat dns PCKST,sl chky,v sl anhy/vrr xl ANHY frag,rr trnsi-crm CHT frag-incl,POR-FLOR AA,g ltbrn/decr brn & blk pp dd o STN,CUT AA"
7200.00 7220.00	"LS tan-crm-ltbrn,occ brn,ooliticlastic-vfxl-crpxl,micsuc-gran,occ GRNST/DOL rich cmt,sl chky/occ POR fl,sl anhy,tr scat dns PCKST,rr wh plty chky prtgs,rr scat wh-trnsi CHT frag,g intxl-occ POR,g even dull-bri yel FLOR,g-fr ltbrn/tr brn & blk STN,CUT AA"
7220.00 7240.00	"LS AA,pred ooliticlastic GRNST/tr DOL cmt,occ v chky/tr POR fl,v sl anhy/rr trnsi xln ANHY incl-frag,tr scat trnsi-miky CHT frag-incl,tr ool incl,g ooliticlastic-intxl POR,g even mod bri-bri yel FLOR,g ltbrn/sl incr brn STN,tr scat blk pp STN,g-fr slow CUT"
7240.00 7260.00	"LS tan-crm,occ ltbrn,brn,wh,vfxl-gran-ooliticlastic,crpxl-micxl,occ GRNST/DOL rich cmt,sl chk/tr scat plty prtgs,occ chky POR fl,tr scat dns PCKST,sl anhy/rr xln AHY incl-frag,POR-FLOR AA,g-fr ltbrn/tr brn STN,rr blk pp dd o STN,g slow strmg milky CUT"
7260.00 7280.00	"LS AA,ooliticlastic-vfxl-micsuc,gran-crpxl-micxl,occ GRNST/DOL rich cmt,tr scat wh-ltgy chky plty prtgs,tr scat dns PCKST,tr wh-trnsi CHT frag,sl anhy/rr xln AHY frag,g intxl-occ POR,FLOR-STN AA,g dif/tr slow strmg milky CUT"
7280.00 7300.00	"LS AA,ooliticlastic GRNST/decr DOL cmt,sl chk/rr scat plty prtgs,sl incr scat dns PCKST,tr wh-trnsi CHT frag,rr xln AHY frag,g-fr intxl-occ POR,g bri-mod bri yel FLOR,g-fr ltbrn-rr brn STN,g dif/slow strmg milky CUT"
7300.00 7320.00	"LS tan-crm,occ ltbrn,brn,wh,vfxl-ooliticlastic-gran,crpxl-micxl,occ GRNST/DOL rich cmt,sl chk/rr scat plty prtgs,occ chky POR fl,tr scat dns PCKST,tr CHT AA,vrr xln AHY incl-frag,POR-FLOR AA,g-fr ltbrn/tr brn STN,vrr blk STN,g dif/slow strmg milky CUT"
7320.00 7340.00	"LS AA,pred ooliticlastic GRNST/DOL rich cmt,sl chk/occ chky POR fl,sl incr scat dns PCKST,tr trnsi-wh CHT frag,rr xln AHY incl-frag,g intxl-occ POR,g even mod bri/scat bri yel FLOR,g-fr ltbrn/rr brn STN,rr blk dd o STN,g slow-mod slow strmg milky CUT"
7340.00 7360.00	"LS tan-crm,occ ltbrn-brn,wh,vfxl-gran-ooliticlastic,crpxl-micxl,occ GRNST/tr DOL rich cmt,v sl chky,decr scat dns PCKST,tr xln AHY incl-frag,tr scat wh-trnsi CHT frag/rr ool incl,POR-FLOR AA,g-fr ltbrn/tr brn STN,rr blk dd o STN,CUT AA"
7360.00 7380.00	"LS tan-crm,occ ltbrn-brn,wh,vfxl-gran-ooliticlastic,micsuc-crpxl,ooliticlastic GRNST,v sl chky,tr scat dns PCKST,tr scat wh-trnsi CHT frag,rr ool,vrr trnsi xl ANHY frag,g intxl-occ POR,g mod bri-scat bri yel FLOR,STN AA/rr blk dd o STN,g dif/slow strmg CUT "
7380.00 7400.00	"LS AA,pred ooliticlastic GRNST,sl chk/tr chky POR fl,tr scat dns PCKST,tr trnsi-wh CHT frag,rr xln AHY incl-frag,g intxl-occ POR,g even mod bri/scat bri yel FLOR,g-fr ltbrn/tr brn STN,rr scat pp blk dd o STN,g slow-mod slow strmg milky CUT"
7400.00 7430.00	"LS tan-ltbrn-crm,occ brn,micxl-vfxl-micsuc,crpxl-gran,pred ooliticlastic/occ oolmoldic GRNST,tr PKST AA,sl chky-anhy,v sl dol,tr wh-trnsi CHT frag,g intxl-occ POR,g mod bri yel FLOR,fr-g ltbrn/tr ltbrn STN,rr blk dd o STN,g dif/tr slow strmg milky CUT"
7430.00 7440.00	"LS AA,ooliticlastic GRNST,tr scat dns-occ oolmoldic PCKST,sl dol ip,v sl chky/rr plty frag,rr crm-tan CHT incl,vrr trnsi xl ANHY frag,g intxl-occ POR,FLOR-STN-CUT AA"

DEPTH	LITHOLOGY
7440.00 7470.00	"LS tan-crm,occ ltbrn-brn,vfxl-gran-ooliclastic,micsuc-crpxl,ooliclastic GRNST,v sl chky,tr scat dns PCKST,tr scat wh-trnsl CHT frag,rr ool,vrr trnsl xl ANHY frag,g intxl-ool POR,g mod bri/scat bri yel FLOR,STN AA/rr blk dd o STN,g slow strmg mlky CUT"
7470.00 7490.00	"LS AA,ooliclastic GRNST,sl chk,v sl dol,tr scat dns PCKST,tr trnsl-wh CHT frag,rr xln AHY incl-frag,g intxl-ool POR,g even mod bri/scat bri yel FLOR,g-fr ltbrn/incr brn STN,incr blk pp dd o STN,g blooming-mod fast strmg mlky CUT"
7490.00 7510.00	"LS tan-crm,occ ltbrn-brn,vfxl-micsuc,crpxl-gran,pred oolastic/tr scat oolmoldic GRNST,tr PKST AA,sl chky/rr scat plty prtgs,v sl dol,rr ANHY & CHT frag,g intxl-ool POR,FLOR AA,fr-g ltbrn/rr ltbrn STN,rr blk dd o STN,g slow-mod fast strmg mlky CUT"
7510.00 7540.00	"LS AA,ooliclastic GRNST,tr scat dns sl chky PCKST,v sl dol,rr trnsl xln ANHY frag,vrr plty chky prtgs,vrr scat CHT frag,g-fr intxl-ooliclastic POR,g even mod bri-bri yel FLOR,g-fr ltbrn/tr brn & blk pp dd o STN,g mod fast strmg mlky CUT"
7540.00 7550.00	"LS AA,pred oolastic LS GRNST,v rr scat trnsl-clr CHT frag,POR-FLOR-STN-CUT AA"
7550.00 7560.00	"LS AA,incr intbd thn tt v sl ool LS PKST,decr CHT frag,v sl anhy,g dull-bri yel FLOR,fr-g intxl-ool POR,fr brn-ltbrn STN,tr spty blk dd o STN,g fast dif-fast stmg CUT"
7559.00 7580.00	"LS tan-brn-ltbrn,rr crm,crpxl-vfxl,gran-micsuc,rr suc,dns ip,v oolastic LS GRNST w/thn tt intbd ool LS PKST,v rr ANHY xl & v rr scat wh-bf CHT frag,g ool-fr intxl POR,g dull-bri yel FLOR,g brn STN,tr blk dd o STN,g fast dif-stmg CUT"
7580.00 7610.00	"LS AA,incr trnsl-clr CHT frag,v g ool-intxl POR,FLOR-STN-CUT AA"
7600.00 7630.00	"LS tan-ltbrn,occ brn-crm,crpxl-vfxl,micsuc-gran,occ dns-tt,ooliclastic,sl anhy-v rr ANHY xl,v sl dol,scat trnsl-clr CHT frag,pred LS GRNST w/thn LS PKST frag-incl,fr-g ool-intxl POR,g bri-dull yel FLOR,fr ltbrn-brn STN,tr spty blk dd o STN,fr-g fast CUT"
7631.00 7650.00	"LS AA,pred oolastic LS GRNST,occ DOL cmt,POR-FLOR-STN AA,g fast dif-fast stmg CUT"
7650.00 7670.00	"LS tan-brn-ltbrn,rr gybrn,crpxl-vfxl,gran-micsuc,rr suc,dns ip,v oolastic-oolmoldic LS GRNST w/thn tt ool LS PKST,v rr ANHY xl & v rr scat wh-bf CHT frag,occ DOL cmt,g ool-fr intxl POR,g dull-bri yel FLOR,g brn STN,tr blk dd o STN,g fast dif-stmg CUT"
7670.00 7680.00	"LS AA,pred v oolastic-sl oolmoldic LS GRNST,v rr v thn LS PKST incl,occ DOL cmt,POR-FLOR-STN-CUT AA"
7680.00 7700.00	"LS AA,bcmg pred sl ool LS PKST,tr-g intxl-ool POR,g bri-dull yel FLOR,tr-fr ltbrn-brn-rr spty blk dd o STN,fr-g fast dif-mod fast stmg CUT"
7700.00 7730.00	"LS tan-brn,occ ltbrn,mot ip,crpxl-vfxl,gran-micsuc ip,occ cln-dns,pred oolastic-sl oolmoldic,tr trnsl ANHY xl-trnsl CHT frag,sl dol,intbd tt tan v sl ool LS PKST,fr-g intxl-fr ool POR,g dull-bri yel FLOR,tr-fr ltbrn-brn STN,tr spty blk STN,g fast CUT"
7730.00 7760.00	"LS tan-ltbrn-brn,micxl-vfxl,crpxl ip,micsuc-gran,pred oolastic-oolmoldic GRNST,tr intbd tt ool LS PKST,rr ANHY xl,occ DOL rich cmt,v rr CHT frag,g ooli-tr-fr intxl POR,g dull-bri yel FLOR,fr-g brn-ltbrn STN,tr blk dd o STN,g fast dif-fast stmg CUT"

DEPTH	LITHOLOGY
7760.00 7780.00	"LS AA,incr trns-l-cr1 CHT frag,sl incr sl ool tt dns LS PKST,v sl decr POR,FLOR-STN-CUT AA"
7780.00 7790.00	"LS AA,incr oolcastic-oolmoldic LS GRNST,n-v rr scat trns-l CHT frag,POR-FLOR-STN-CUT AA"
7790.00 7800.00	"LS tan-ltbrn,occ brn,crpxl-vfxl,occ gran-micsuc,dns-tt ip,oolcastic-oolmoldic,intbd LS GRNST-PKST,scat CHT frag-ANHY xl,tr-g intxl-ool POR,fr-g dull-bri yel FLOR,tr brn STN,rr spty blk dd o STN,g fast dif-stmg CUT"
7800.00 7810.00	"LS AA,pred oolcastic-oolmoldic LS GRNST,w/v thn intbd LS PKST,g ool-intxl POR,g bri-dull yel FLOR,g ltbrn-brn-rr spty blk STN,g fast dif-fast stmg CUT"
7810.00 7820.00	"LS AA,incr tt ool LS PKST,bcmg v ool LS GRNST w/depth,tr-g ool-intxl POR,fr-g dull-bri yel FLOR,tr-g STN AA,n-g CUT AA"
7820.00 7850.00	"LS tan-ltbrn,occ brn,micxl-vfxl,micsuc-gran,oolcastic-oolmoldic,occ crpxl-dns,sl anhy-tr ANHY xl-v rr intxl,v rr CHT frag,occ DOL cmt,pred v ool LS GRNST,tr LS PKST,fr-g intxl-ool POR,g bri-dull yel FLOR,g ltbrn-brn STN,tr spty blk dd o STN,g fast CUT"
7850.00 7880.00	"LS tan-ltbrn,occ brn,micxl-vfxl,micsuc-gran,oolcastic-oolmoldic,rr crpxl-dns,v rr ANHY xl-v rr incl,v rr CHT frag,occ DOL rich cmt,pred v ool LS GRNST,v rr LS PKST,g intxl-ool POR,g bri-dull yel FLOR,g ltbrn-brn STN,tr spty blk dd o STN,g fast stmg CUT"
7880.00 7900.00	"LS tan-ltbrn,occ brn,crpxl-vfxl,occ gran-micsuc,dns-tt ip,oolcastic-oolmoldic,intbd LS GRNST-PKST,scat CHT frag-ANHY xl,tr-g intxl-ool POR,fr-g dull-bri yel FLOR,tr brn STN,rr spty blk dd o STN,g fast dif-stmg CUT"
7900.00 7910.00	"LS tan,occ ltbrn-crm ip,crpxl-micxl,vfxl-gran ip,occ micsuc,sl ool-oolcastic,pred sl ool LS PKST,w/intbd oolcastic LS GRNST,scat trns-l ANHY xl-CHT frag,tr-fr intxl-tr ool POR,g bri yel FLOR,rr-tr brn STN,rr spty blk dd o STN,tr-fr fast dif-slow stmg CUT"
7910.00 7920.00	"LS AA,bcmg v g oolcastic LS GRNST,tr-g intxl-ool POR,fr-g bri yel FLOR,g STN & CUT"
7920.00 7940.00	"LS tan-ltbrn,occ brn,micxl-vfxl,micsuc-gran,oolcastic-oolmoldic,occ crpxl-dns,sl anhy-tr ANHY xl-v rr incl,v rr CHT frag,occ DOL cmt,pred v ool LS GRNST,tr LS PKST,fr-g intxl-ool POR,g bri-dull yel FLOR,g ltbrn-brn STN,tr spty blk dd o STN,g fast CUT"
7940.00 7970.00	"LS tan-ltbrn,micxl-vfxl,micsuc-gran,oolcastic-oolmoldic,occ crpxl-dns,sl anhy-v rr ANHY xl-incl,v rr CHT frag,occ DOL cmt,pred v ool LS GRNST,tr LS PKST,fr-g intxl-ool POR,g bri-dull yel FLOR,g ltbrn-brn STN,tr spty blk dd o STN,g fast dif-stmg CUT"
7970.00 8000.00	"LS tan-ltbrn,occ brn,micxl-vfxl,micsuc-gran,oolcastic-oolmoldic,rr crpxl-dns,v rr ANHY xl-v rr incl,v rr CHT frag,occ DOL rich cmt,pred v ool LS GRNST,v rr LS PKST,g intxl-ool POR,g bri-dull yel FLOR,g ltbrn-brn STN,tr spty blk dd o STN,g fast stmg CUT"
8000.00 8020.00	"LS tan-ltbrn,crpxl-vfxl,gran-micsuc,oolcastic,occ dns,intbd ool-oolmoldic LS GRNST & v sl ool LS PKST,scat ANHY xl-v rr CHT frag,fr-g intxl-ool POR,g dull-bri yel FLOR,tr-fr ltbrn-brn STN,v rr spty blk dd o STN,fr-g mod fast-fast dif-stmg CUT"
8020.00 8030.00	"LS AA,rr scat trns-l-wh mot occ ool CHT frag,sl incr LS PKST,POR-FLOR-STN-CUT AA"

MOBIL, Ratherform Unit #14-32, Northwest Laterals



DIVISION OF OIL, GAS AND MINING
ENTITY ACTION FORM - FORM 6

OPERATOR MOBIL PRODUCING TX & NM, INC.

OPERATOR ACCT. NO. N 7370

ADDRESS P. O. BOX 633

MIDLAND, TEXAS 79702

ACTION CODE	CURRENT ENTITY NO.	NEW ENTITY NO.	API NUMBER	WELL NAME	WELL LOCATION					SPUD DATE	EFFECTIVE DATE
					QQ	SC	TP	RG	COUNTY		
B	99999	06280	43-037-31153	RATHERFORD UNIT #18-W-12	SW/	18	41S	24E	SAN JUAN	6-10-97	
WELL 1 COMMENTS: Entity added 9-18-97. (Ratherford Unit) <i>lic</i>											
WELL 2 COMMENTS:											
WELL 3 COMMENTS:											
WELL 4 COMMENTS:											
WELL 5 COMMENTS:											

ACTION CODES (See instructions on back of form)

- A - Establish new entity for new well (single well only)
- B - Add new well to existing entity (group or unit well)
- C - Re-assign well from one existing entity to another existing entity
- D - Re-assign well from one existing entity to a new entity
- E - Other (explain in comments section)

NOTE: Use COMMENT section to explain why each Action Code was selected.

(3/89)

Shirley Houchins
Signature SHIRLEY HOUCHINS
ENV. & REG. TECH 8-18-97
Title _____ Date _____
Phone No. (915) 688-2585

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN DUPLICATE*

(See other in-
structions on
reverse side)FORM APPROVED
OMB NO. 1004-0137
Expires: February 28, 1995

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

1a. TYPE OF WELL: OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> DRY <input type="checkbox"/> Other <u>INJECTOR/SIDETRACK</u>		5. LEASE DESIGNATION AND SERIAL NO. 14-20-603-353	
b. TYPE OF COMPLETION: NEW WELL <input type="checkbox"/> WORK OVER <input type="checkbox"/> DEEP-EN <input type="checkbox"/> PLUG BACK <input type="checkbox"/> DIFF. RESVR. <input type="checkbox"/> Other <u>SIDETRACK</u>		6. IF INDIAN, ALLOTTEE OR TRIBE NAME NAVAJO TRIBAL	
2. NAME OF OPERATOR Mobil Exploration & Producing U.S. Inc. as Agent for Mobil Producing TX & NM Inc.		7. UNIT AGREEMENT NAME RATHERFORD UNIT	
3. ADDRESS AND TELEPHONE NO. P.O. Box 633, Midland, TX 79702 (915) 688-2585		8. FARM OR LEASE NAME, WELL NO. RATHERFORD 18-W-12	
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)* At surface SW/NW 1980' FNL & 560' FWL At top prod. interval reported below * #37 At total depth * #37		9. API WELL NO. 43-037-31153	
14. PERMIT NO.		DATE ISSUED	12. COUNTY OR PARISH SAN JUAN
			13. STATE UTAH
15. DATE SPUDDED 06-10-97	16. DATE T.D. REACHED 07-15-97	17. DATE COMPL. (Ready to prod.) 07-31-97	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)* 4675' GR
20. TOTAL DEPTH, MD & TVD ** #37	21. PLUG, BACK T.D., MD & TVD ** #37	22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY X
24. PRODUCING INTERVAL(S), OF THIS COMPLETION - TOP, BOTTOM, NAME (MD AND TVD)* ** #37 <i>DSCK</i>			25. WAS DIRECTIONAL SURVEY MADE YES
26. TYPE ELECTRIC AND OTHER LOGS RUN <i>MUD LOG 4-22-97</i>			27. WAS WELL CORED NO
28. CASING RECORD (Report all strings set in well)			
CASING SIZE/GRADE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE
13 3/8"	48#	100'	17 1/2"
9 5/8# K55	36#	1600'	12 1/4"
7" K55	23 & 26#	5700'	8 1/2"
29. LINER RECORD			
SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*
30. TUBING RECORD			
SIZE	DEPTH SET (MD)	PACKER SET (MD)	
2 3/8"	5221"	5221'	
31. PERFORATION RECORD (Interval, size and number)			
32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.			
DEPTH INTERVAL (MD)		AMOUNT AND KIND OF MATERIAL USED	
5690-8364'		LAT #2/ACID/W/1342BBL 15% HCL	
5610-9124'		LAT #1/ACID/W/1734BBL 15% HCL	
33.* PRODUCTION			
DATE FIRST PRODUCTION	PRODUCTION METHOD (Flowing, gas lift, pumping - size and type of pump)		WELL STATUS (Producing or shut-in) INJECTOR
DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD
FLOW. TUBING PRESS.	CASING PRESSURE 0	CALCULATED 24-HOUR RATE	OIL - BBL.
34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.)			
35. LIST OF ATTACHMENTS DIRECTIONAL SURVEY REPORT			
36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records			
SIGNED <i>Shirley Houchins</i>		TITLE ENV. & REG. TECHNICIAN	
		DATE 09-11-1997	

*(See Instructions and Spaces for Additional Data on Reverse Side)

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN DUPLICATE*

(See other instructions on reverse side)

FORM APPROVED
OMB NO. 1004-0137
Expires: February 28, 1995

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

1a. TYPE OF WELL: OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> DRY <input type="checkbox"/> Other <u>INJECTOR/SIDETRACK</u>						5. LEASE DESIGNATION AND SERIAL NO. 14-20-603-353	
b. TYPE OF COMPLETION: NEW WELL <input type="checkbox"/> WORK OVER <input type="checkbox"/> DEEP-EN <input type="checkbox"/> PLUG BACK <input type="checkbox"/> DIFF. RESVR. <input type="checkbox"/> Other <u>SIDETRACK</u>						6. IF INDIAN, ALLOTTEE OR TRIBE NAME NAVAJO TRIBAL	
2. NAME OF OPERATOR Mobil Exploration & Producing U.S. Inc. as Agent for Mobil Producing TX & NM Inc.						7. UNIT AGREEMENT NAME RATHERFORD UNIT	
3. ADDRESS AND TELEPHONE NO. P.O. Box 633, Midland, TX 79702 (915) 688-2585						8. FARM OR LEASE NAME, WELL NO. RATHERFORD 18-W-12	
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)* At surface SW/NW 1980' FNL & 560' FWL At top prod. interval reported below * #37 At total depth * #37						9. API WELL NO. 43-037-31153	
14. PERMIT NO.				DATE ISSUED		12. COUNTY OR PARISH SAN JUAN	13. STATE UTAH
15. DATE SPURRED 06-10-97	16. DATE T.D. REACHED 07-15-97	17. DATE COMPL. (Ready to prod.) 07-31-97	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)* 4675' GR		19. ELEV. CASINGHEAD		
20. TOTAL DEPTH, MD & TVD ** #37		21. PLUG, BACK T.D., MD & TVD ** #37		22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY X	ROTARY TOOLS	CABLE TOOLS
24. PRODUCING INTERVAL(S), OF THIS COMPLETION - TOP, BOTTOM, NAME (MD AND TVD)* ** #37 <u>DSCK</u>							25. WAS DIRECTIONAL SURVEY MADE YES
26. TYPE ELECTRIC AND OTHER LOGS RUN <u>MUD LOG 4-22-97</u>							27. WAS WELL CORED NO
28. CASING RECORD (Report all strings set in well)							
CASING SIZE/GRADE		WEIGHT, LB./FT.		DEPTH SET (MD)		HOLE SIZE	
13 3/8"		48#		100'		17 1/2"	
9 5/8# K55		36#		1600'		12 1/4"	
7" K55		23 & 26#		5700'		8 1/2"	
TOC 2000'							
29. LINER RECORD							
SIZE		TOP (MD)		BOTTOM (MD)		SACKS CEMENT*	
30. TUBING RECORD							
SIZE		DEPTH SET (MD)		PACKER SET (MD)			
2 3/8"		5221"		5221'			
31. PERFORATION RECORD (Interval, size and number)							
32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.							
DEPTH INTERVAL (MD)				AMOUNT AND KIND OF MATERIAL USED			
5690-8364'				LAT #2/ACID/W/1342BBL 15% HCL			
5610-9124'				LAT #1/ACID/W/1734BBL 15% HCL			
33.* PRODUCTION							
DATE FIRST PRODUCTION		PRODUCTION METHOD (Flowing, gas lift, pumping - size and type of pump)				WELL STATUS (Producing or shut-in) INJECTOR	
DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD	OIL - BBL.	GAS - MCF.	WATER - BBL.	GAS - OIL RATIO
FLOW. TUBING PRESS.	CASING PRESSURE 0	CALCULATED 24-HOUR RATE	OIL - BBL.	GAS - MCF.	WATER - BBL.	OIL GRAVITY - API (CORR.)	
34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.)							
35. LIST OF ATTACHMENTS DIRECTIONAL SURVEY REPORT							
36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records							
SIGNED <u>Shirley Houchins</u>		TITLE ENV. & REG. TECHNICIAN				DATE 09-11-1997	

*(See Instructions and Spaces for Additional Data on Reverse Side)

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

37. SUMMARY OF POROUS ZONES: (Show all important zones of porosity and contents thereof; cored intervals; and all drill-stem, tests, including depth interval tested, cushion used, flowing and shut-in pressures, and recoveries):					38. GEOLOGIC MARKERS		
FORMATION	TOP	BOTTOM	DESCRIPTION, CONTENTS, ETC.		NAME	MEAS. DEPTH	TRUE VERT. DEPTH
* #4 .			LAT #1 2463' SOUTH & 2632' EAST F/SURFACE LAT #2 1771' NORTH & 2422' WEST F/SURFACE				
*** #20, 21, 24			LAT #1 (5562-9124' TMD)(5488-5473' TVD) LAT #2 (5570-8364' TMD)(5475-5462' TVD)				

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT -" for such proposals

SUBMIT IN TRIPLICATE

1. Type of Well

☐ Oil Well

☐ Gas Well

☒ Other

INJECTOR / SIDETRACK

2. Name of Operator Mobil Exploration & Producing U.S. Inc.
as Agent for Mobil Producing TX & NM Inc.

3. Address and Telephone No.

P.O. Box 633, Midland, TX 79702

915-688-2585

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

1980' FNL & 560' FWL
SEC.18, T41S, R24E

FORM APPROVED

Budget Bureau No. 1004-0135

Expires: March 31, 1993

5. Lease Designation and Serial No.

14-20-603-353

6. If Indian, Allottee or Tribe Name

NAVAJO TRIBAL

7. If Unit or CA, Agreement Designation

RATHERFORD UNIT

8. Well Name and No.

RATHERFORD 18-W-12

9. API Well No.

43-037-31153

10. Field and Pool, or exploratory Area

GREATER ANETH

11. County or Parish, State

SAN JUAN UT

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

☐

Notice of Intent

☒

Subsequent Report

☐

Final Abandonment Notice

TYPE OF ACTION

☐

Abandonment

☐

Recompletion

☐

Plugging Back

☐

Casing Repair

☐

Altering Casing

☒

Other

SIDETRACK

☐

Change of Plans

☐

New Construction

☐

Non-Routine Fracturing

☐

Water Shut-Off

☐

Conversion to Injection

☐

Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

BOTTOM HOLE LOCATIONS:

LEG #1: 2463' SOUTH & 2632' EAST FROM SURFACE SPOT (ZONE 1a).

LEG #2: 1771' NORTH & 2422' WEST FROM SURFACE SPOT (ZONE 1a).

SEE ATTACHED PROCEDURE.

14. I hereby certify that the foregoing is true and correct

Signed

Shirley Boachin

Title

ENV. & REG. TECHNICIAN

Date

09-11-1997

(This space for Federal or State office use)

Approved by

Title

Date

Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

* See Instruction on Reverse Side

09/26/97
JRB

DRILLED FOOTAGE CALCULATION FOR DIRECTIONAL AND HORIZONTAL WELLS

Well Name: Ratherford 18-W-12
Surface Location: 1980' FNL, 560' FWL, 18-41S-24

First leg description: Leg #1

KOP MD:	5368.00
KOP TVD:	5366.46
EOL MD:	9124.00
EOL TVD:	5473.20
Footage drilled:	3756.00

Second leg description: Leg #2

KOP MD:	5291.00
KOP TVD:	5289.46
EOL MD:	8364.00
EOL TVD:	5461.52
Footage drilled:	3073.00

Third leg description:

KOP MD:	
KOP TVD:	
EOL MD:	
EOL TVD:	
Footage drilled:	

Fourth leg description:

KOP MD:	
KOP TVD:	
EOL MD:	
EOL TVD:	
Footage drilled:	

Fifth leg description:

KOP MD:	
KOP TVD:	
EOL MD:	
EOL TVD:	
Footage drilled:	

09/26/97
JRB

Total Footage Drilled (MD):	6829.00
Deepest point (TVD):	5489.29

ATTACHMENT - FORM 3160-5
RATHERFORD UNIT #18-W-12
14-20-603-247A
NAVAJO TRIBAL
SAN JUAN, UTAH

06-10-97 10:09 AM 06-09-97 TALKED TO EARL BECHER. BLM IMPENDING INTENT TO PREP FOR DRILLING RIG. NOTIFIED NAVAJO EPA @ 10:12 TALKED TO MELVIN CAPITAN ANSWERING MACHINE, INTENT TO PREP FOR DRILLING RIG. MIRU NAVAJO WEST RIG #36. SICP @ 12:30 WAS 0 PSI. PRESSURE @ @ 2700 PSI. OPEN WELL UP TO TEST TANK, FLOW WELL, RIG UP TO RIG PUMP & PUMP 35 BBLS OF 10# BRINE DON TBG. PRESSURE TO 500 PSI. SWIFN.

06-11-97 RIG UP & KILL WELL, SITP @ 7:30 WAS 1700 PSI. SICP WAS 0 PSI. RIG UP SWAB TEE, RIG UP LUBRICATOR, RIH ON SAND LINE TO 3196'. POH W/LUBRICATOR. NIPPLE DOWN INJECTION WELLHEAD, RELEASE PKR/POH W/PKR & TBG SIFN.

06-12-97 SICP @ 7:30 WAS 1100 PSI FLOW DOWN TO 50 PSI. RIG UP & RIH W/ARROW 7" PKR @ 5251', RU INJ. WELL HEAD. RIG UP CHART & PRESSURE TEST CSG & PKR TO 1000 PSI. 30 MIN, OK., RIG UP WELL HEAD FLOW LINES, SWIFN.

06-13-97 RIG DOWN, MOVE OFF, NAVAJO WEST RIG #36. WELL SHUT IN.

06-19-97 SITP 2700 PSI, RU LINES TO FRAC TANK. OPEN UP TBG TO TANKS, PRESSURE F/2700 PSI TO 75 PSI IN 1 HR. RECOVER 100 BBLS IN 1ST HR. CONTINUE TO FLOWBACK OVER NIGHT TO TANKS.

06-20-97 WELL FLOW BACK 200 BBL OVER NIGHT, TBG PRESS 50 PSI. ND WELLHEAD, NU & TEST BOP. OPEN BYPASS ON PKR, PUMP 10# BRINE DN TBG. UNSET PKR. POOH W/PKR & TBG. PU BIT & SCRAPER RIH & TAG HIGH. RU TO FRAC TANKS OVER NIGHT.

06-21-97 TOO H W/BIT & SCRAPER, TALLY OUT OF HOLE, TBG LENGH 5484'. RIH W/RBP @ 5400'. CIRC 10# BRINE ON TOP OF PLUG. TEST CSG TO 1000 PSI. SDFN

06-23-97 RDMO NAVAJO WEST RIG #15. LAST REPORT FOR PREP JOB.

06-27-97 MIRU NAVAJO WEST #25.

06-28-97 FIN RIG UP NW#25., NU BOP, TEST, CHANGE OUT ANNULAR BOP, RIH W/RET TOOL, POH W/RBP.

06-29-97 RIH W/TIW LATCH KEYWAY ASSM, TOP OF WHIPSTOCK @ 5368' W/SLIDE SET @120 DEG. CUT WINDOW F/5368-5370 W/STARTER MILL. POH W/STARTER MILL RIH W/ 6 1/8" WINDOW & WATERMELLON MILL ON SAME BHA TO 5368'

06-29-97 RIH W/LATCH ASSM., LATCH INTO PKR @ 5385'. RUN GYRO SURVEY & LOCATE PKR KEYWAY @ 101 DEG GTF, POH W/ KEYWAY LATCH ASSM.

06-30-97 LATERAL #1, MILLED WINDOW F/5368-5376' & DRILLED FORM TO 5377', PUMPED POLYMER SWEEPS & CIRC HOLE CLEAN, POH W/MILLS FINAL REPORT.

06-30-97 CUT DRILLING LINE, RIH W/CURVE DRILLING ASSM, RIH W/GYRO, DRILL CURVE ON LATERAL 1A1 F/5377-5387.

07-01-97 LATERAL 1A1 CURVE, CONT DRILL F/5387-5562. PUMPED SWEEP, POH LD MM, RIH W/ LATERAL ASSM.

07-02-97 FIN RIH W/LATERAL ASSM., SLIDE & ROTATE DRILLED LATERAL 1A1 F/5562-6307'.

07-03-97 LATERAL 1A1, SLIDE & ROTATE F/6307-7099', WELL STARTED FLOWING, BLEED PRESS OFF, POH & LD DP.

07-04-97 LATERAL 1A1, SLIDE & ROTATE F/7099-7865'.

07-05-97 LATERAL 1A1, SLIDE & ROTATE F/7865-8835'.

07-06-97 LATERAL 1A1, SLIDE & ROTATE F/8835-9124'. CIRC CLEAN, POH & LD MUD MOTORS. FINAL REPORT LATERAL 1A1.

**ATTACHMENT - FORM 3160-5
RATHERFORD UNIT #18-W-12**

**14-20-603-247A
NAVAJO TRIBAL
SAN JUAN, UTAH
PAGE 2**

07-07-97 POH W/LATERAL #1A1 WHIPSTOCK, RIH W/LATERAL #2 WHIPSTOCK, POH, RIH W/STARTER MILL, POH, RIH W/WINDOW MILL. MILL WINDOW F/5291-5293'. CIRC HOLE CLEAN.

07-08-97 LATERAL #2 POH W/WINDOW MILL, RIH W/STARTER MILL & FINISH CUTTING LUG ON WHIPSTOCK, POOH W/STARTER MILL. RIH W/CSG MILL & CUT WINDOW F/5291-5299', DRILL 1' FORMATION TO 5300'.

07-09-97 PU CURVE BUILDING ASSM, TIH . RU GYRO DATA WL, FAN SURVEYS & TIME DRILL F/5300-5304, SLIDE DRILL F/5304-5333', SURVEY & RD GYRO WL. SLIDE DRILL F/5333-5430' & SURVEYS.

07-10-97 LATERAL #2A1 SLIDE DRILL CURVE SECTION F/5430-5570'.

07-11-97 LATERAL #2A1, SLIDE & ROTATE F/5570-5960'

07-12-97 LATERAL #2A1, SLIDE & ROTATE F/5960-7100'

07-13-97 LATERAL #2A1, SLIDE & ROTATE F/7100-8140'.

07-14-97 LATERAL #2A1, SLIDE & ROTATE F/8140-8364' TD, POOH TO VERTICAL. POOH LAYING DOWN DP. TIH W/DC'S PH-6 TBG, LD DOWN.

07-15-97 FINISH LAYING DOWN DRILL STRING, NIPPLE DOWN BOP STACK, CHOKE MANIFOLD, CLEAN PITS, RELEASE RIG AT MIDNIGHT., FINAL DRILLING REPORT.

COMPLETION

07-18-97 MIRU NWI RIG #26. RU PUMP, PITS, LINES TO TANKS. PU RETRIEVING HEAD, RIH, TAG RBP, TEST BOP TO 250#/750# 15 MIN. EA., RELEASE RBP, FLOW BACK TO TANK. ATTEMPT TO KILL W/10#, NO LUCK, ORDER MUD, SDFN.

07-19-97 RELEASE RBP, FLOW BACK TO TANK, RESET PLUG. CIRC 11.6# MUD ON TOP OF PLUG, UNSET PLUG, RIH TO 5200' W/RBP & SET. CIRC 100 BBL 14.5#. POOH W/RBP, RIH W/14 JTS PH6, PKR & 167 JTS 2 7/8" TBG TO 5674. SET PKR @ 5239. TEST TO 500#. SDFN.

07-20-97 LATERAL #2A1: MIRU DOWELL CT UNIT & PUMPS. RIH WCT TO 8364'. ACIDIZE W/1342 BBLs 15% HCL ACID F/8364-5690'.

07-21-97 FLOW WELL BACK TO TANK. PH TO 6, RECOVER 2008 BBLs LOAD, SIP @ 10AM @ 800#.

07-22-97 POOH W/PKR, RIH W/RETRIEVING TOOL, LATCH ONTO WHIPSTOCK, PULL FREE W/25K OVER. SDFN.

07-23-97 POOH W/WHIPSTOCK ASSM, START TO SWAB IN. SHUT IN BACKSIDE & FILL HOLE AS POOH. WELL CAME IN @ SURFACE. SHUT IN HYDRILL, FLOW OUT BACKSIDE. FLOW OVERNIGHT.

07-24-97 ORIENT RE-ENTRY GUIDE TO 120 DEG. FOR LATERAL #1A1, RIH & SET. POOH W/SETTING TOOL, PU PH6 & PKR, RIH & SET EOT @ 5610', PKR @ 5173' TEST PKR TO 500#, SDFN.

07-25-97 SITP 0 PSI. RU DOWELL, SPOT PUMPS & LINES, TEST LINES TO 4000#. RIH W/1.75" CT TO 9131'. ACIDIZE LATERAL #1A1 W/1734 BBLs 15% HCL F/9124-5610' @ 2.5-3.5 BPM. AVG BACKSIDE PRESSURE 1700#. ISIP 1744#, 15 MIN SIP 450#. OPEN UP TO TANK, FLOWING @ 100 PSI, 50 BBL 1ST HR.

**ATTACHMENT - FORM 3160-5
RATHERFORD UNIT #18-W-12**

**14-20-603-247A
NAVAJO TRIBAL
SAN JUAN, UTAH
PAGE 3**

07-26-97 CONTINUE TO FLOW BACK TO TANKS ON. PH TO 7 AFTER 800 BBL, RECOVER 1000 BBLs LOAD. UNSET PKR, PUMP TBG CAPACITY 10#, WELL ON VACUUM. POOH W/PKR & PH6, RIH W/RETRIEVING TOOL, SHEAR OUT OF WHIPSTOCK, POOH, LD WHIPSTOCK ASSY. RIH W/3000' KILL STRING, SDFN & SUNDAY.

07-28-97 BLEED GAS OFF WELL, POOH & LD 3000' KILL STRING. RU POWER TONGS, ATTEMPT TO MU PIPE. POWER TONGS NO GOOD. LOCATE OTHER POWER TONGS, RIH W/80 JTS 2 7/8" KILL STRING TO 2460' SDFN.

07-30-97 SIP @ 7:30 WAS 50 PSI. OPEN TO TEST TANK. RIH W/GUIBERSON PKR & CMT. LINED TBG TO 5220.94'. SET 2 7/8" TBG HANGER. NIPPLE DOWN BOPE, MAKE UP PRODUCTION TREE. DISPLACE ANN. W/170 BBLs PKR RLUID. NIPPLE UP & TEST PKR. 1050PSI 30 MIN. OK SIFN

CALLED EARL AHTSOSIE @ 7:30 ON 7-30-97 INFORMED OF HOOKUP READY ON 8-1-97., CALLED THOMPSON TSOSIE @ 7:30 ON 7-30-97 INFORMED OF MIT READY ON 8-1-97, CALLED DIANE WILSON @ 7:30 ON 7-30-97 INFORMED OF INJECTOR READY ON 8-1-97. TALKED TO ANSWERING MACHINE ON ALL THREE CALLS.

07-31-97 RIG DOWN MOVE OFF NAVAJO WEST RIG #26. WELL SHUT IN. FINAL COMPLETION REPORT. WELL TURN TO PRODUCTION.

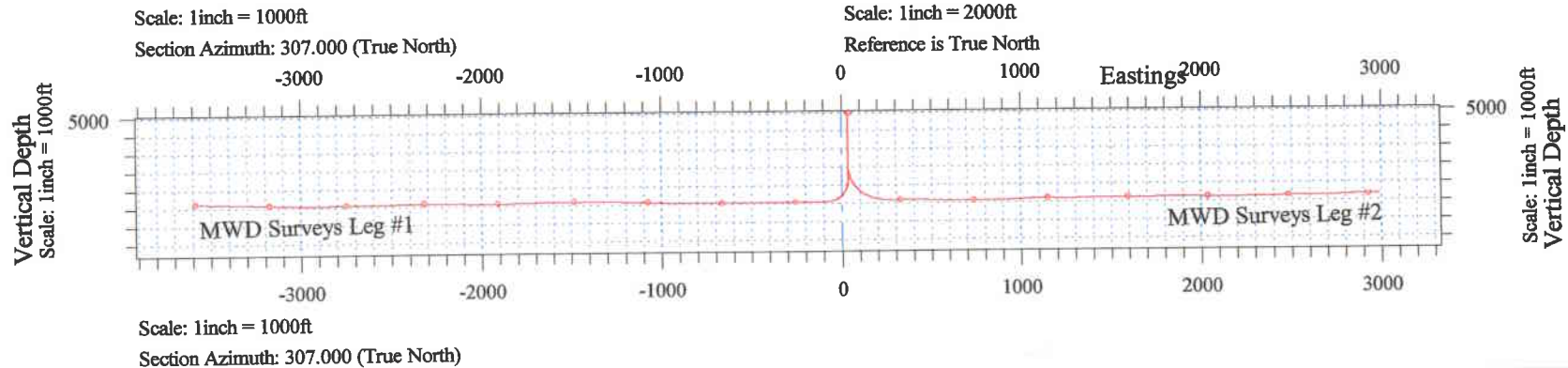
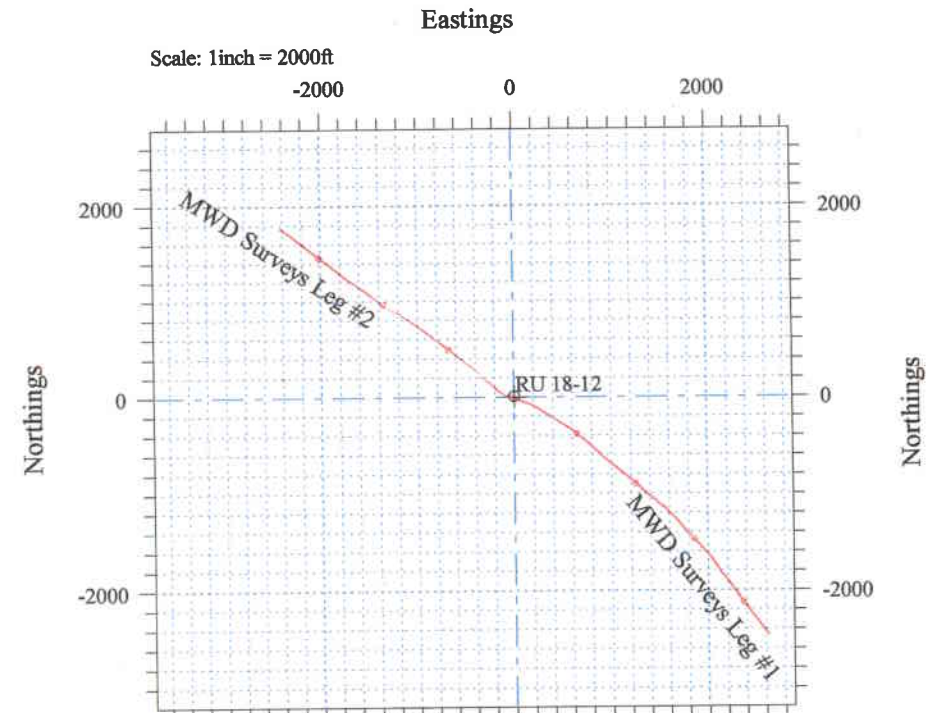
08-26-97 MIRU NAVAJO WEST RIG #36. RIG UP FLOW LINES & PUMP, FLOW WELL 1 HOUR. PRESSURE F/1100 PSI TO 100 PSI. NIPPLE DOWN PRODUCTION TREE. NIPPLE UP BOPE. RIG UP & KILL WELL RELEASE G-6 PKR. POH, LAY DOWN TBG & PKR. SIFN.

08-27-97 MAKE UP RETV. WHIPSTOCK & RIH TO 5385'. SET WHIPSTOCK POH & LAY DOWN RETV. TOOLS. RIH W/PH6 TAIL PIPE, PKR, RUN 2.875" TBG TO 5219' PKR DEPTH. 5565 END OF TAIL PIPE. NIPPLE DOWN BOPE. NIPPLE UP TREE. TEST TO 1000 PSI. OK SIFN.

08-28-97 RIG UP INJECTION LINE. RIG DOWN MOVE OFF NAVAJO WEST RIG #36, TEMP. SUSPEND OPS.

09-02-97 MIRU COILED TBG UNIT. RIH W/1.75" COILED TBG. TO 5610' LOG WELL W/SCHLUMBERGER COILED TBG. GAMMA RAY LOG & TEMP LOG F/9124-5610'. PUMP 20 MCL OF IODINE 131 AND RUN LOG AGAIN. POH W/COILED TBG. RIG DOWN, OPEN WELL ON INJECTION @ 422 BBLs PER/DAY. SHUT WELL IN.

Customer: Mobil
Folder: Mobil
Field: San Juan County
Project: Utah
Structure: Ratherford Unit
Well: RU 18-12



Vertical Section

Prepared:

Checked:

Approved:

sperry-sun
DRILLING SERVICES
A DRESSER INDUSTRIES, INC. COMPANY

Mobil
San Juan County
Utah
Ratherford Unit
RU 18-12 - MWD Surveys Leg #1

SURVEY REPORT

30 July, 1997

Survey Ref: svy1785

Sperry-Sun Drilling Services

Survey Report for RU 18-12

Mobil
San Juan County

Utah
Ratherford Unit

	Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Gyro								
	0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
	200.00	0.800	200.560	199.99	1.31 S	0.49 W	0.23	0.400
	400.00	0.860	218.230	399.97	3.79 S	1.91 W	0.24	0.131
	600.00	1.430	241.360	599.93	6.17 S	5.03 W	-1.27	0.361
	800.00	2.020	277.920	799.85	6.88 S	10.71 W	-5.84	0.609
	1000.00	2.660	281.660	999.68	5.46 S	18.75 W	-13.51	0.329
	1200.00	2.780	284.750	1199.45	3.28 S	27.98 W	-22.59	0.095
	1400.00	2.550	281.700	1399.24	1.15 S	37.03 W	-31.50	0.135
	1600.00	2.490	286.200	1599.04	0.97 N	45.56 W	-39.94	0.103
	1800.00	1.950	290.730	1798.89	3.39 N	52.91 W	-47.52	0.284
	2000.00	1.130	276.660	1998.82	4.82 N	58.05 W	-52.69	0.448
	2200.00	0.670	291.070	2198.80	5.47 N	61.10 W	-55.65	0.255
	2400.00	0.940	104.310	2398.79	5.48 N	60.61 W	-55.23	0.804
	2600.00	1.250	75.590	2598.75	5.62 N	56.90 W	-52.09	0.310
	2800.00	1.040	72.960	2798.71	6.69 N	53.05 W	-49.29	0.108
	3000.00	0.980	53.400	2998.68	8.25 N	49.95 W	-47.38	0.174
	3200.00	1.130	49.680	3198.65	10.54 N	47.07 W	-46.03	0.082
	3400.00	0.930	36.690	3398.62	13.12 N	44.60 W	-45.18	0.153
	3600.00	0.690	71.700	3598.60	14.80 N	42.48 W	-44.19	0.269
	3800.00	0.420	126.780	3798.59	14.74 N	40.75 W	-42.66	0.283
	4000.00	0.630	168.000	3998.58	13.22 N	39.94 W	-41.20	0.209
	4200.00	0.870	205.700	4198.57	10.78 N	40.37 W	-40.35	0.268
	4400.00	0.960	209.190	4398.54	7.95 N	41.84 W	-40.21	0.053
	4600.00	0.730	216.530	4598.52	5.46 N	43.42 W	-40.33	0.127
	4800.00	0.790	231.470	4798.50	3.58 N	45.25 W	-40.98	0.103
	5000.00	0.800	226.970	4998.48	1.77 N	47.35 W	-41.89	0.032
MWD Surveys Leg #1								
	5200.00	0.570	190.290	5198.47	0.16 S	48.55 W	-41.97	0.242
	5368.00	0.360	142.450	5366.46	1.40 S	48.38 W	-41.20	0.252
	5377.00	3.600	108.780	5375.46	1.52 S	48.09 W	-40.89	36.738
	5387.00	8.500	107.440	5385.40	1.84 S	47.09 W	-39.86	49.017
	5397.00	13.700	107.010	5395.21	2.41 S	45.25 W	-37.99	52.006
	5407.00	18.500	106.790	5404.81	3.21 S	42.60 W	-35.29	48.004
	5417.00	23.500	106.650	5414.15	4.24 S	39.17 W	-31.80	50.002
	5427.00	28.900	106.560	5423.11	5.50 S	34.94 W	-27.51	54.001
	5437.00	33.900	106.500	5431.65	6.99 S	29.95 W	-22.44	50.001
	5447.00	38.700	107.700	5439.70	8.73 S	24.29 W	-16.67	48.521

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-12

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5457.00	43.900	108.200	5447.21	10.76 S	18.01 W	-10.22	52.104
5467.00	48.400	109.500	5454.14	13.10 S	11.19 W	-3.15	45.964
5477.00	53.400	107.700	5460.45	15.57 S	3.84 W	4.46	51.911
5487.00	57.400	109.200	5466.12	18.17 S	3.97 E	12.52	41.860
5497.00	60.800	111.100	5471.26	21.13 S	12.02 E	20.97	37.704
5507.00	65.200	109.400	5475.80	24.21 S	20.38 E	29.75	46.532
5517.00	69.800	108.300	5479.62	27.19 S	29.12 E	38.81	47.108
5527.00	74.300	107.400	5482.70	30.11 S	38.17 E	48.11	45.807
5537.00	79.200	106.600	5485.00	32.95 S	47.48 E	57.59	49.614
5547.00	83.700	109.800	5486.48	36.04 S	56.87 E	67.27	55.007
5562.00	87.900	110.400	5487.58	41.18 S	70.91 E	82.00	28.283
5612.30	90.000	112.200	5488.50	59.45 S	117.76 E	131.71	5.498
5644.18	89.800	114.600	5488.56	72.11 S	147.02 E	163.38	7.554
5675.95	89.500	116.500	5488.75	85.81 S	175.68 E	195.05	6.054
5707.67	90.200	118.700	5488.84	100.51 S	203.79 E	226.74	7.278
5739.37	90.400	120.600	5488.67	116.19 S	231.34 E	258.44	6.027
5771.16	88.900	121.300	5488.86	132.54 S	258.60 E	290.22	5.207
5802.26	90.000	121.400	5489.16	148.71 S	285.16 E	321.31	3.552
5834.09	90.800	121.400	5488.94	165.30 S	312.32 E	353.13	2.513
5865.05	90.400	121.300	5488.62	181.40 S	338.76 E	384.08	1.332
5896.92	90.500	121.600	5488.37	198.03 S	365.95 E	415.94	0.992
5928.01	90.500	122.100	5488.09	214.44 S	392.36 E	447.01	1.608
5959.78	91.500	122.100	5487.54	231.32 S	419.27 E	478.75	3.148
5991.57	90.600	121.800	5486.96	248.14 S	446.24 E	510.52	2.984
6023.33	88.600	121.100	5487.18	264.71 S	473.33 E	542.27	6.672
6054.38	87.900	121.100	5488.13	280.74 S	499.90 E	573.30	2.254
6086.24	89.300	121.100	5488.91	297.19 S	527.17 E	605.14	4.394
6118.13	90.100	123.200	5489.07	314.16 S	554.17 E	637.01	7.047
6149.91	89.600	125.300	5489.16	332.04 S	580.44 E	668.70	6.793
6181.68	89.900	127.600	5489.29	350.92 S	605.99 E	700.26	7.301
6213.44	90.500	128.300	5489.18	370.45 S	631.04 E	731.72	2.903
6244.49	90.200	127.600	5488.99	389.54 S	655.52 E	762.47	2.453
6276.33	89.600	130.200	5489.05	409.53 S	680.30 E	793.92	8.380
6307.33	90.500	131.100	5489.02	429.73 S	703.82 E	824.39	4.106
6339.08	90.800	131.100	5488.66	450.60 S	727.74 E	855.54	0.945
6369.73	90.300	130.800	5488.37	470.68 S	750.89 E	885.63	1.902
6401.56	89.900	130.400	5488.31	491.40 S	775.06 E	916.92	1.777
6433.35	90.400	131.300	5488.23	512.19 S	799.10 E	948.14	3.239
6465.20	91.100	132.000	5487.81	533.36 S	822.90 E	979.33	3.108
6496.96	93.300	133.200	5486.59	554.84 S	846.26 E	1010.30	7.889
6528.66	92.400	133.400	5485.02	576.55 S	869.30 E	1041.11	2.908
6560.47	92.700	133.200	5483.60	598.34 S	892.43 E	1072.04	1.133
6592.12	90.500	131.300	5482.72	619.61 S	915.84 E	1102.95	9.183
6623.85	90.400	130.400	5482.47	640.37 S	939.84 E	1134.11	2.854
6655.70	90.500	129.900	5482.22	660.90 S	964.19 E	1165.46	1.601

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-12

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6687.52	92.200	129.900	5481.47	681.31 S	988.59 E	1196.80	5.343
6719.40	92.400	130.100	5480.19	701.78 S	1012.99 E	1228.17	0.887
6751.05	89.800	129.000	5479.58	721.93 S	1037.39 E	1259.37	8.919
6782.69	89.900	128.800	5479.66	741.80 S	1062.02 E	1290.63	0.707
6814.36	90.400	129.000	5479.58	761.69 S	1086.66 E	1321.92	1.700
6846.19	90.300	129.400	5479.39	781.80 S	1111.33 E	1353.34	1.295
6877.96	90.200	129.500	5479.25	801.99 S	1135.86 E	1384.68	0.445
6909.71	91.100	129.900	5478.89	822.27 S	1160.29 E	1415.97	3.102
6940.70	90.400	129.700	5478.48	842.10 S	1184.09 E	1446.51	2.349
6972.52	90.500	130.200	5478.23	862.54 S	1208.49 E	1477.85	1.602
7004.30	90.900	132.200	5477.84	883.47 S	1232.39 E	1509.02	6.417
7036.01	90.400	131.500	5477.48	904.62 S	1256.01 E	1540.05	2.713
7067.01	90.400	131.300	5477.27	925.12 S	1279.27 E	1570.44	0.645
7113.51	88.400	130.600	5477.76	955.59 S	1314.38 E	1616.09	4.557
7145.37	87.400	130.200	5478.92	976.23 S	1338.63 E	1647.40	3.380
7176.33	87.800	130.200	5480.22	996.19 S	1362.26 E	1677.85	1.292
7208.15	88.400	129.900	5481.27	1016.66 S	1386.60 E	1709.16	2.108
7239.91	88.800	129.700	5482.05	1036.98 S	1410.99 E	1740.45	1.408
7271.63	89.100	129.400	5482.63	1057.18 S	1435.45 E	1771.72	1.337
7303.38	89.000	128.600	5483.16	1077.15 S	1460.12 E	1803.08	2.539
7335.13	88.900	128.500	5483.74	1096.94 S	1484.94 E	1834.47	0.445
7366.97	88.900	128.300	5484.35	1116.71 S	1509.89 E	1865.96	0.628
7398.79	89.000	129.900	5484.93	1136.78 S	1534.58 E	1897.37	5.037
7430.58	88.400	129.900	5485.66	1157.16 S	1558.96 E	1928.68	1.887
7462.25	89.000	132.000	5486.37	1177.91 S	1582.87 E	1959.77	6.895
7494.09	91.100	133.900	5486.35	1199.60 S	1606.18 E	1990.79	8.894
7524.99	92.300	135.700	5485.43	1221.37 S	1628.09 E	2020.65	6.999
7556.73	91.200	138.000	5484.46	1244.51 S	1649.79 E	2051.01	8.029
7620.24	91.100	138.800	5483.19	1291.99 S	1691.95 E	2111.26	1.269
7683.79	91.000	138.300	5482.02	1339.62 S	1734.01 E	2171.50	0.802
7747.45	91.600	138.500	5480.58	1387.21 S	1776.26 E	2231.89	0.993
7810.91	88.600	137.800	5480.47	1434.47 S	1818.59 E	2292.19	4.854
7874.33	88.400	137.600	5482.13	1481.37 S	1861.26 E	2352.58	0.446
7938.00	89.600	137.100	5483.24	1528.19 S	1904.39 E	2413.35	2.042
8001.66	89.500	136.400	5483.74	1574.55 S	1948.01 E	2474.30	1.111
8065.31	89.500	138.500	5484.29	1621.44 S	1991.05 E	2535.02	3.299
8128.75	90.500	143.200	5484.29	1670.62 S	2031.09 E	2594.29	7.574
8192.43	89.700	144.600	5484.18	1722.07 S	2068.61 E	2652.50	2.532
8256.05	88.700	144.500	5485.07	1773.89 S	2105.50 E	2710.37	1.580
8319.53	88.600	143.600	5486.57	1825.27 S	2142.76 E	2768.32	1.426
8382.53	88.800	142.900	5487.99	1875.73 S	2180.44 E	2826.19	1.155
8446.12	90.600	143.400	5488.33	1926.62 S	2218.58 E	2884.65	2.938
8509.71	91.700	143.800	5487.05	1977.79 S	2256.31 E	2942.91	1.841
8573.21	91.600	143.100	5485.22	2028.78 S	2294.11 E	3001.14	1.113
8636.82	90.700	143.400	5483.95	2079.74 S	2332.16 E	3059.58	1.491

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-12

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8700.43	91.900	142.700	5482.50	2130.56 S	2370.38 E	3118.09	2.184
8763.85	92.100	142.200	5480.29	2180.81 S	2409.01 E	3176.67	0.849
8827.58	90.400	142.200	5478.90	2231.15 S	2448.06 E	3235.66	2.667
8891.21	90.700	141.700	5478.29	2281.25 S	2487.28 E	3294.67	0.916
8954.95	92.400	141.700	5476.56	2331.25 S	2526.77 E	3353.87	2.667
9018.53	92.800	141.300	5473.68	2380.96 S	2566.30 E	3412.97	0.889
9092.01	88.900	141.500	5472.59	2438.37 S	2612.13 E	3481.36	5.315
9124.00	88.900	141.500	5473.20	2463.40 S	2632.04 E	3511.12	0.000

All data is in feet unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Well. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100ft.

Vertical Section is from Well and calculated along an Azimuth of 120.000° (True).

Based Upon Minimum Curvature type calculations, at a Measured Depth of 9124.00ft.,
The Bottom Hole Displacement is 3605.00ft., in the Direction of 133.104° (True).

sperry-sun
DRILLING SERVICES
A DRESSER INDUSTRIES, INC. COMPANY

Mobil
San Juan County
Utah
Ratherford Unit
RU 18-12 - MWD Surveys Leg #2

SURVEY REPORT

30 July, 1997

Survey Ref: svy1809

Sperry-Sun Drilling Services

Survey Report for RU 18-12

Mobil
San Juan County

Utah
Ratherford Unit

	Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Gyro								
	0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
	200.00	0.800	200.560	199.99	1.31 S	0.49 W	-0.40	0.400
	400.00	0.860	218.230	399.97	3.79 S	1.91 W	-0.76	0.131
	600.00	1.430	241.360	599.93	6.17 S	5.03 W	0.30	0.361
	800.00	2.020	277.920	799.85	6.88 S	10.71 W	4.41	0.609
	1000.00	2.660	281.660	999.68	5.46 S	18.75 W	11.69	0.329
	1200.00	2.780	284.750	1199.45	3.28 S	27.98 W	20.37	0.095
	1400.00	2.550	281.700	1399.24	1.15 S	37.03 W	28.88	0.135
	1600.00	2.490	286.200	1599.04	0.97 N	45.56 W	36.97	0.103
	1800.00	1.950	290.730	1798.89	3.39 N	52.91 W	44.29	0.284
	2000.00	1.130	276.660	1998.82	4.82 N	58.05 W	49.26	0.448
	2200.00	0.670	291.070	2198.80	5.47 N	61.10 W	52.09	0.255
	2400.00	0.940	104.310	2398.79	5.48 N	60.61 W	51.70	0.804
	2600.00	1.250	75.590	2598.75	5.62 N	56.90 W	48.83	0.310
	2800.00	1.040	72.960	2798.71	6.69 N	53.05 W	46.40	0.108
	3000.00	0.980	53.400	2998.68	8.25 N	49.95 W	44.85	0.174
	3200.00	1.130	49.680	3198.65	10.54 N	47.07 W	43.94	0.082
	3400.00	0.930	36.690	3398.62	13.12 N	44.60 W	43.51	0.153
	3600.00	0.690	71.700	3598.60	14.80 N	42.48 W	42.83	0.269
	3800.00	0.420	126.780	3798.59	14.74 N	40.75 W	41.42	0.283
	4000.00	0.630	168.000	3998.58	13.22 N	39.94 W	39.85	0.209
	4200.00	0.870	205.700	4198.57	10.78 N	40.37 W	38.73	0.268
	4400.00	0.960	209.190	4398.54	7.95 N	41.84 W	38.20	0.053
	4600.00	0.730	216.530	4598.52	5.46 N	43.42 W	37.96	0.127
	4800.00	0.790	231.470	4798.50	3.58 N	45.25 W	38.30	0.103
	5000.00	0.800	226.970	4998.48	1.77 N	47.35 W	38.88	0.032
MWD Surveys Leg #2								
	5200.00	0.570	190.290	5198.47	0.16 S	48.55 W	38.68	0.242
	5291.00	0.420	169.630	5289.46	0.94 S	48.57 W	38.23	0.254
	5300.00	1.600	290.500	5298.46	0.92 S	48.68 W	38.32	20.566
	5320.00	6.900	295.510	5318.40	0.31 S	50.03 W	39.77	26.540
	5340.00	13.800	296.380	5338.06	1.27 N	53.26 W	43.30	34.508
	5360.00	21.200	296.750	5357.13	3.96 N	58.63 W	49.21	37.004
	5380.00	28.400	296.960	5375.27	7.75 N	66.11 W	57.46	36.003
	5400.00	35.200	297.100	5392.26	12.54 N	75.49 W	67.83	34.002
	5420.00	41.600	292.700	5407.93	17.73 N	86.76 W	79.96	34.779
	5440.00	48.500	294.700	5422.05	23.43 N	99.71 W	93.73	35.215

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-12

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5460.00	53.000	300.000	5434.70	30.56 N	113.44 W	108.99	30.440
5480.00	58.800	302.200	5445.91	39.12 N	127.61 W	125.45	30.394
5500.00	66.000	302.600	5455.17	48.61 N	142.56 W	143.11	36.044
5520.00	70.000	308.400	5462.67	59.38 N	157.64 W	161.63	33.503
5540.00	74.100	315.700	5468.84	72.12 N	171.74 W	180.57	40.313
5560.00	80.100	316.400	5473.30	86.15 N	185.27 W	199.81	30.193
5580.00	82.800	315.000	5476.27	100.31 N	199.08 W	219.36	15.171
5600.00	84.400	312.500	5478.50	114.05 N	213.43 W	239.09	14.775
5620.00	86.000	310.200	5480.18	127.21 N	228.39 W	258.96	13.976
5640.00	89.400	309.500	5480.98	140.02 N	243.73 W	278.92	17.356
5657.54	91.900	309.000	5480.78	151.11 N	257.32 W	296.44	14.535
5688.16	92.000	308.800	5479.74	170.33 N	281.13 W	327.03	0.730
5719.96	90.000	308.800	5479.19	190.25 N	305.91 W	358.81	6.289
5751.71	91.300	308.500	5478.82	210.08 N	330.70 W	390.54	4.202
5783.53	89.700	308.300	5478.55	229.84 N	355.64 W	422.35	5.067
5815.27	87.400	308.300	5479.35	249.51 N	380.54 W	454.07	7.246
5846.95	87.200	307.800	5480.84	269.01 N	405.46 W	485.71	1.698
5878.74	88.100	308.500	5482.15	288.63 N	430.43 W	517.46	3.585
5910.35	88.400	308.800	5483.11	308.37 N	455.11 W	549.05	1.342
5942.11	88.900	309.000	5483.86	328.30 N	479.82 W	580.78	1.696
5973.83	89.200	309.400	5484.39	348.35 N	504.40 W	612.47	1.576
6005.63	89.300	309.500	5484.80	368.55 N	528.95 W	644.24	0.445
6037.40	89.500	309.700	5485.13	388.80 N	553.43 W	675.98	0.890
6069.28	89.600	309.900	5485.38	409.21 N	577.92 W	707.82	0.701
6100.92	90.000	310.100	5485.50	429.55 N	602.16 W	739.41	1.413
6132.60	89.800	309.200	5485.55	449.76 N	626.55 W	771.06	2.910
6196.18	90.600	308.100	5485.33	489.47 N	676.20 W	834.61	2.139
6258.82	91.600	308.300	5484.13	528.20 N	725.42 W	897.22	1.628
6322.48	92.500	308.300	5481.85	567.63 N	775.35 W	960.83	1.414
6386.03	92.500	307.800	5479.08	606.76 N	825.34 W	1024.31	0.786
6449.55	92.000	307.400	5476.58	645.49 N	875.63 W	1087.77	1.008
6512.35	88.600	305.500	5476.25	682.79 N	926.13 W	1150.56	6.202
6575.95	89.700	304.600	5477.20	719.31 N	978.19 W	1214.11	2.235
6639.36	90.800	303.700	5476.92	754.91 N	1030.67 W	1277.44	2.241
6702.95	90.100	302.500	5476.42	789.63 N	1083.94 W	1340.88	2.185
6766.51	89.600	304.100	5476.59	824.52 N	1137.06 W	1404.30	2.637
6830.08	90.300	304.800	5476.64	860.48 N	1189.48 W	1467.81	1.557
6893.73	91.100	305.100	5475.87	896.94 N	1241.64 W	1531.42	1.342
6957.12	90.800	305.000	5474.82	933.34 N	1293.53 W	1594.76	0.499
7019.76	89.600	304.400	5474.60	969.00 N	1345.03 W	1657.35	2.142
7083.34	90.300	306.000	5474.65	1005.65 N	1396.98 W	1720.89	2.747
7146.77	91.800	304.800	5473.49	1042.39 N	1448.67 W	1784.29	3.028
7210.46	92.200	305.800	5471.27	1079.17 N	1500.62 W	1847.91	1.690
7274.10	88.200	305.000	5471.04	1116.02 N	1552.48 W	1911.51	6.410
7337.70	88.700	303.900	5472.77	1151.99 N	1604.91 W	1975.02	1.899

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 18-12

Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
7401.30	89.400	305.100	5473.82	1188.01 N	1657.32 W	2038.55	2.184
7464.89	89.900	306.700	5474.21	1225.29 N	1708.82 W	2102.13	2.636
7528.39	90.100	307.400	5474.21	1263.55 N	1759.50 W	2165.63	1.146
7592.08	90.200	307.400	5474.04	1302.23 N	1810.10 W	2229.31	0.157
7655.52	90.900	307.100	5473.43	1340.63 N	1860.59 W	2292.75	1.200
7719.17	91.000	309.000	5472.38	1379.86 N	1910.71 W	2356.38	2.989
7782.69	91.800	308.600	5470.83	1419.64 N	1960.20 W	2419.85	1.408
7846.18	92.100	309.000	5468.66	1459.40 N	2009.65 W	2483.27	0.787
7909.59	89.900	307.800	5467.56	1498.78 N	2059.33 W	2546.64	3.952
7973.15	88.900	308.300	5468.22	1537.95 N	2109.38 W	2610.19	1.759
8036.72	89.900	308.300	5468.89	1577.35 N	2159.26 W	2673.74	1.573
8100.43	92.400	307.400	5467.61	1616.43 N	2209.56 W	2737.42	4.170
8164.20	92.500	308.100	5464.88	1655.44 N	2259.93 W	2801.13	1.108
8227.91	91.300	306.400	5462.77	1693.98 N	2310.61 W	2864.80	3.265
8290.56	89.600	304.300	5462.28	1730.22 N	2361.71 W	2927.42	4.312
8333.00	91.000	304.100	5462.06	1754.07 N	2396.81 W	2969.80	3.332
8364.00	91.000	304.100	5461.52	1771.45 N	2422.47 W	3000.76	0.000

All data is in feet unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Well. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100ft.
Vertical Section is from Well and calculated along an Azimuth of 307.000° (True).

Based Upon Minimum Curvature type calculations, at a Measured Depth of 8364.00ft.,
The Bottom Hole Displacement is 3001.07ft., in the Direction of 306.176° (True).

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

1. Type of Well

☐ Oil Well ☐ Gas Well ☒ Other

2. Name of Operator **MOBIL PRODUCING TX & NM INC.***
***MOBIL EXPLORATION & PRODUCING US INC. AS AGENT FOR MPTM**

3. Address and Telephone No.

P.O. Box 633, Midland TX 79702 (915) 688-2585

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

SEC. 18, T41S, R24E
(SW/NW) 1980' FNL & 560' FWL

FORM APPROVED

Budget Bureau No. 1004-0135
Expires: March 31, 1993

5. Lease Designation and Serial No.

14-20-603-353

6. If Indian, Allottee or Tribe Name

NAVAJO TRIBAL

7. If Unit or CA, Agreement Designation

RATHERFORD UNIT

8. Well Name and No.

RATHERFORD 18-W-12

9. API Well No.

43-037-31153

10. Field and Pool, or exploratory Area

GREATER ANETH

11. County or Parish, State

SAN JUAN UT

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

- ☐ Notice of Intent
☐ Subsequent Report
☐ Final Abandonment Notice

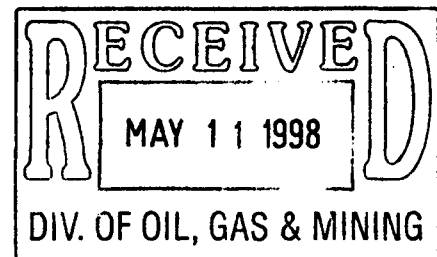
TYPE OF ACTION

- ☐ Abandonment
☐ Recompletion
☐ Plugging Back
☐ Casing Repair
☐ Altering Casing
☒ Other **MIT TESTS**
- ☐ Change of Plans
☐ New Construction
☐ Non-Routine Fracturing
☐ Water Shut-Off
☐ Conversion to Injection
☐ Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

SEE ATTACHED MIT AND CHART.



14. I hereby certify that the foregoing is true and correct

Signed

Shirley Houchins

Title **SHIRLEY HOUCHINS/ENV & REG TECH**

Date **5-13-98**

(This space for Federal or State office use)

Approved by

Title

Date

Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

* See Instruction on Reverse Side

ANNULAR PRESSURE TEST

(Mechanical Integrity Test)

Operator Mobil E. & P., Inc

Date of Test 8-8-97

Well Name RU # 18W-12

EPA Permit No. _____

Location Sec. 18, T41S-R24E

Tribal Lease No. _____

State and County San Juan County, UT

Continuous Recorder? YES ☒ NO ☐

Pressure Gauge? YES ☒ NO ☐

Bradenhead Opened? YES ☒ NO ☐

Fluid Flow? YES ☐ NO ☒

<u>TIME</u>	<u>ANNULUS PRESSURE, psi</u>	<u>TUBING PRESSURE, psi</u>
<u>4:00</u>	<u>1100</u>	<u>0</u>
<u>4:05</u>	<u>1095</u>	
<u>4:10</u>	<u>1090</u>	
<u>4:20</u>	<u>1085</u>	
<u>4:30</u>	<u>1085</u>	

MAX. INJECTION PRESSURE: _____ PSI

MAX. ALLOWABLE PRESSURE CHANGE: _____ PSI (TEST PRESSURE X 0.05)

REMARKS: Passed? Failed? If failed, cease injection until well passes MIT (40CFR§144.21(c)(6)).

*PASSED M.I.T.
NEWLY HORIZONTAL WELL*

Fritz Johnson
COMPANY REPRESENTATIVE: (Print and Sign)

8-8-97

DATE

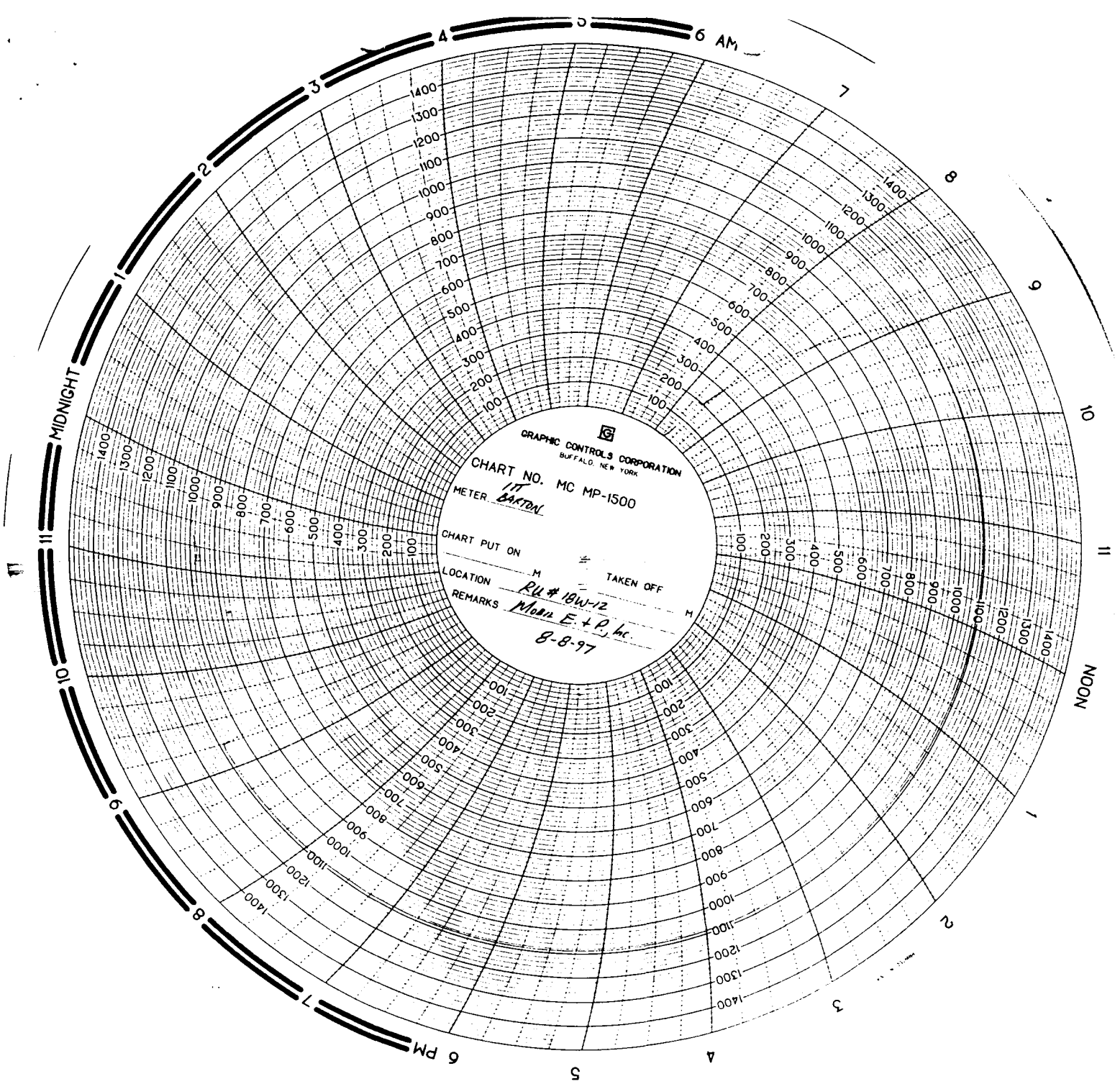
Melvin Capitan Jr.
INSPECTOR: (Print and Sign)

8-8-97

DATE

NOTICE OF INSPECTION

Address (EPA Regional Office) Region 9 Environmental Inspection Agency 215 Fremont Street (W-6-2) San Francisco, CA 94105		Inspection Contractor Navajo EPA THE CADMUS GROUP, INC. CORPORATE OFFICE 10000 N. GILBERT AVE. WILLOW PARK, CO 80151 (303) 761-1500		Firm To Be Inspected Mobil E.&P., Inc. P.O. Box Dawer G Cortez, Co 81321
Date 8-5-97	Notice of inspection is hereby given according to Section 1445(b) of the Safe Drinking Water Act (42 U.S.C. §300 f et seq.).			
Hour 8:00 AM				
Reason For Inspection For the purpose of inspecting records, files, papers, processes, controls and facilities, and obtaining samples to determine whether the person subject to an applicable underground injection control program has acted or is acting in compliance with the Safe Drinking Water Act and any applicable permit or rule.				
MCU # Q-12A WATER INJECTION WELL, M.I.T. - PASSED MCU # O-12, WATER INJECTION WELL, M.I.T. - PASSED MCU # P-13, WATER INJECTION WELL, M.I.T. - PASSED MCU # O-14, WATER INJECTION WELL, M.I.T. - PASSED MCU # P-07, WATER INJECTION WELL, M.I.T. - PASSED MCU # L-09, WATER INJECTION WELL, M.I.T. - PASSED MCU # Q-10, WATER INJECTION WELL, M.I.T. - PASSED MCU # P-15, WATER INJECTION WELL, M.I.T. - PASSED MCU # O-16, WATER INJECTION WELL, M.I.T. - PASSED MCU # O-18, WATER INJECTION WELL, M.I.T. - PASSED MCU # N -23, WATER INJECTION WELL, M.I.T. - FAILED RU # 18W-12, WATER INJECTION WELL, M.I.T. - PASSED				
Section 1445(b) of the SDWA (42 U.S.C. §300 j-4 (b)) is quoted on the reverse of this form.				
Receipt of this Notice of Inspection is hereby acknowledged.				
Firm Representative 	Date 8-5-97	Inspector 		



STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

ORIGINAL FILING ☐
AMENDED FILING ☐

DESIGNATION OF WORKOVER OR RECOMPLETION

1. Name of Operator MOBIL EXPLORATION/PRODUCING U.S.	2. Utah Account Number N-	3. Well Name and Number RATHERFORD UNIT 18-12	
3. Address of Operator P. O. DRAWER G		6. API Well Number 43-037-31153-00	
CORTEZ, COLORADO 81321		4. Telephone Number 303-565-2207	7. Field Name GREATER ANETH
9. Location of Well Footage : OO, Sec. T., R. :		8. Field Code Number	
		County : SAN JUAN State : UTAH	

COMPLETE ALL SECTIONS. ATTACH ADDITIONAL SHEETS IF NEEDED.

10. TYPE OF WORK (Check One)	11.
<input type="checkbox"/> Production enhancement <input type="checkbox"/> Convert to injection <input type="checkbox"/> Recompletion <input checked="" type="checkbox"/> Repair well	Date work commenced <u>2/21/98</u> Date work completed <u>2/25/98</u>

12. THE FOLLOWING EXPENSES FOR OPERATIONS ARE SUBMITTED FOR DESIGNATION AS WORKOVER OR RECOMPLETION EXPENSES UNDER U.C.A. 59-5-102(4):

- a. Location preparation and cleanup
- b. Move-in, rig-up and rig-down (including trucking)
- c. Rig charges (including fuel)
- d. Drill pipe or other working string
- e. Water and chemicals for circulating fluid (including water hauling)
- f. Equipment purchase
- g. Equipment rental
- h. Cementing
- i. Perforating
- j. Acidizing
- k. Fracture stimulation
- l. Logging services
- m. Supervision and overhead
- n. Other (itemize)

TRF TELLER SLICKLINE

Expenses	Division Approval
\$ 1400	
860	
8243	
—	
Mud 14325	
—	
500	
—	
—	
—	
—	
2500	
—	
4653	
—	
—	

o. Total submitted expenses

\$ 29481

p. Total approved expenses

\$

13. LIST CONTRACTORS PROVIDING SERVICES VALUED AT MORE THAN \$3,000.00.

Contractor	Location (city, state)	Services Provided
BIG A	CORTEZ	PULLING UNIT
MIDRILL FLUIDS	MONTEZUMA CREEK	MUD
TRF TELLER	FARMINGTON	SLICKLINE

14. LIST WORKING INTEREST OWNERS WHO TAKE PRODUCT IN KIND AND ARE AUTHORIZED TO SHARE IN THE TAX CREDIT.

Name	Address	Utah Account No.	Percent of Interest

I hereby certify that the foregoing is true and correct

Name & Signature

M. N. Harbin

Title CONSULTANT

Date 2/27/98

(State Use Only)

Exhibit B

14. LIST WORKING INTEREST OWNERS WHO TAKE PRODUCT IN KIND AND ARE AUTHORIZED TO SHARE IN THE TAX CREDIT.

Ratherford Unit

Name	Address	Percent of Interest
MEPNA	P O Box 219063 Dallas TX 75221-9063	.7417002
Texaco Exploration & Production Inc.	P O Box 2100 Denver CO 80201-2100	.0445384
Chieftan International (US) Inc.	1201 Toronto Dominion Twr Edmonton Alberta TBJ-221 Canada	.2137614

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT -" for such proposals

SUBMIT IN TRIPLICATE

1. Type of Well

☐ Oil Well ☐ Gas Well ☒ Other

2. Name of Operator

MOBIL PRODUCING TX & NM INC.*
*MOBIL EXPLORATION & PRODUCING US INC. AS AGENT FOR MPTM

3. Address and Telephone No.

P.O. Box 633, Midland TX 79702 (915) 688-2585

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

SEC. 18, T41S, R24E
(SW/NW) 1980' FNL & 560' FWL

FORM APPROVED

Budget Bureau No. 1004-0135
Expires: March 31, 1993

5. Lease Designation and Serial No.

14-20-603-353

6. If Indian, Allottee or Tribe Name

NAVAJO TRIBAL

7. If Unit or CA, Agreement Designation

RATHERFORD UNIT

8. Well Name and No.

RATHERFORD 18-W-12

9. API Well No.

43-037-31153

10. Field and Pool, or exploratory Area

GREATER ANETH

11. County or Parish, State

SAN JUAN UT

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

- ☒ Notice of Intent
☐ Subsequent Report
☐ Final Abandonment Notice

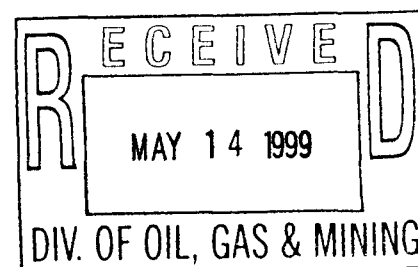
TYPE OF ACTION

- ☐ Abandonment
☐ Recompletion
☐ Plugging Back
☐ Casing Repair
☐ Altering Casing
☒ Other MIT CHART
- ☐ Change of Plans
☐ New Construction
☐ Non-Routine Fracturing
☐ Water Shut-Off
☐ Conversion to Injection
☐ Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

SEE ATTACHED CHART.



14. I hereby certify that the foregoing is true and correct

Signed

Shirley Houchins

Title SHIRLEY HOUCHINS/ENV & REG TECH

Date 5-12-99

(This space for Federal or State office use)

Approved by

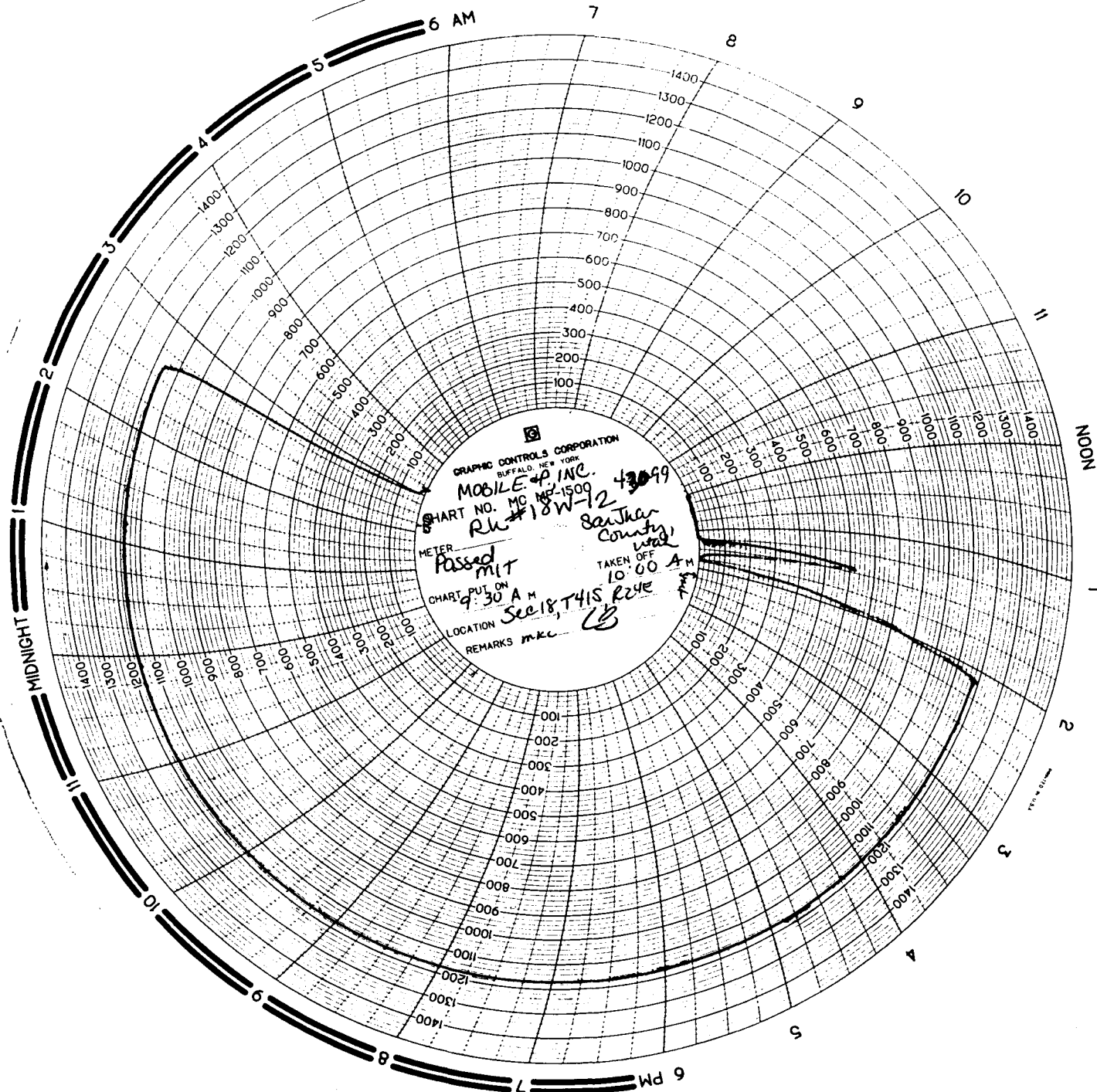
Title

Date

Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

* See instruction on Reverse Side



GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
MOBILE P, INC. 43099
CHART NO. MC 1500
RH 18W-12
METER Passed MIT
CHART PUT ON 9:30 A.M.
LOCATION See 18, T415 R24
REMARKS mkl
TAKEN OFF 10:00 A.M.
San Juan County, Wash
CB

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0135
Expires November 30, 2000

SUNDRY NOTICES AND REPORTS ON WELLS
*Do not use this form for proposals to drill or to re-enter an
Abandoned well. Use Form 3160-3 (APD) for such proposals.*

SUBMIT IN TRIPLICATE - Other Instructions on reverse side

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator
Mobil Producing TX & NM Inc*
*Mobil Exploration & Producing US Inc as agent for MPTM

3a. Address
P.O. Box 4358, Houston, TX 77210-4358

3b. Phone No. (include area code)
713-431-1022

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
See attached listing

43.637.31153

5. Lease Serial No.
See attached listing
6. If Indian, Allottee or Tribe Name
NAVAJO TRIBAL
7. If Unit or CA/Agreement, Name and/or No.
Ratherford Unit

8. Well Name and No.
See attached listing

9. API Well No.
See attached listing

10. Field and Pool, or Exploratory Area
Greater Aneth

11. County or Parish, State
San Juan, UTAH

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input checked="" type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other <u>Power & Pipelines</u>
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection)

*Mobil Exploration & Producing US Inc. as agent for Mobil Producing Texas & New Mexico Inc. & Mobil Exploration & Producing North America Inc. plans to bury >36" deep water injection & carbon dioxide injection pipelines in same trench. Will install raptor proof ≤25 kv powerlines in same 20' (50' for Ratherford 15-42) wide pipeline corridor. Total length will be 1.45 miles. Pipe diameter will range from 2" to 8". Pipe will be coated, seamless welded steel. Maximum operating pressure will be ~3,200 psi. Test pressure will be ~4,250 psi. Test media source will be water and carbon dioxide respectively from Mobil's own system. All will discharge back into Mobil's system. Tribal approved archaeologist will supervise installation of avoidance fencing and monitor construction at TCP 15-3. All in unit. All Navajo Tribal Trust surface and minerals.

Diameter	Pipe Specifications
8"	0.438" W.T., API 5LX-40
6"	0.375" W.T., API 5LX-40
4"	0.337" W.T., API 5LX-42
3"	0.300" W.T., API 5LX-42
2"	0.218" W.T., API 5LX-42

RECEIVED

MAY 17 2000

DIVISION OF
OIL, GAS AND MINING

14. I hereby certify that the foregoing is true and correct
Name (Printed/Typed)
Mark Del Pico

Title EHS Advisor

Signature

Mark Del Pico

Date 5-8-2000

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Title

Date

Office

Accepted by the
Utah Division of
Oil, Gas and Mining

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully making any statement or representation to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

COPY SENT TO OPERATOR
Date: 5-22-00
Initials: CND

Federal Approval of this
Action is Necessary

FOR RECORD ONLY

			FEDERAL	
WELL NAME	WELL #	API NUMBER	STATE	LOCATION
			LEASE	
Ratherford Unit	13-42 ✓	43-037-25857	14-20-603-247A	2139' FSL & 585' FEL Sec 13-T41S-R23E
Ratherford Unit	15-23	43-037-21768	14-20-603-355	2587' FSL & 2410' FWL Sec 15-T41S-R23E
Ratherford Unit	15-41 ✓	43-037-15719	14-20-603-355	660' FNL & 660' FEL Sec 15-T41S-R23E
Ratherford Unit	15-42 ✓	43-037-30448	14-20-603-355	2020' FNL & 820' FEL Sec 15-T41S-R23E
Ratherford Unit	18-12	43-037-21768	14-20-603-353	1980' FNL & 560' FWL Sec 18-T41S-R23E
Ratherford Unit	21-34 ✓	43-037-15756	14-20-603-355	660' FSL & 1980' FEL Sec 21-T41S-R23E

15857
16412
24E
24E
31153
24E

RECEIVED
MAY 17 2008
DIVISION OF
OIL, GAS AND MINING

ExxonMobil Production Comp
U.S. West
P.O. Box 4358
Houston, Texas 77210-4358

June 27, 2001

ExxonMobil
Production

Mr. Jim Thompson
State of Utah, Division of Oil, Gas and Mining
1549 West North Temple
Suite 1210
Salt Lake City, UT 84114-5801

Change of Name – Mobil Oil Corporation to
ExxonMobil Oil Corporation

Dear Mr. Thompson

Effective June 1, 2001, Mobil Oil Corporation (MOC) changed its name to ExxonMobil Oil Corporation (EMOC). This was a name change only; EMOC is the same corporation as Mobil Oil Corporation, but with a new name. No facility or other asset was transferred from one corporation to another by virtue of the name change. Specifically, EMOC will remain the owner and operator of its existing exploration and production oil and gas properties and facilities, as well as relevant permits.

There is no change to the name of Exxon Mobil Corporation, the ultimate shareholder of EMOC.

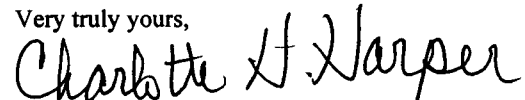
Please note the change of name of MOC to ExxonMobil Oil Corporation in your records pertaining to any MOC permits.

The Federal Identification Number for MOC (13-5401570) will remain the same for EMOC.

A copy of the Certification, Bond Rider and a list of wells are attached.

If you have any questions please feel free to call Joel Talavera at 713-431-1010

Very truly yours,



Charlotte H. Harper
Permitting Supervisor

ExxonMobil Production Company
a division of Exxon Mobil Corporation,
acting for ExxonMobil Oil Corporation

RECEIVED

JUN 29 2001

DIVISION OF
OIL, GAS AND MINING



IN REPLY REFER TO:

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS

~~XXXXXXXXXXXX~~
 Navajo Area Office
NAVAJO REGION

 P.O. Box 1060
 Gallup, New Mexico 87305-1060
AUG 30 2001

RRES/543

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

 Charlotte H. Harper, Permitting Supervisor
 Exxon Mobil Production Company
 U. S. West
 P. O. Box 4358
 Houston, TX 77210-4358

Dear Ms. Harper:

This is to acknowledge receipt of your company's name change from Mobil Oil Corporation to ExxonMobil Oil Corporation effective June 1, 2001. The receipt of documents includes the Name Change Certification, current listing of Officers and Directors, Listing of Leases, Financial Statement, filing fees of \$75.00 and a copy of the Rider for Bond Number 8027 31 97. There are no other changes.

Please note that we will provide copies of these documents to other concerned parties. If you need further assistance, you may contact Ms. Bertha Spencer, Realty Specialist, at (928) 871-5938.

Sincerely,

DENNETT DENETSONE

Regional Realty Officer

 cc: BLM, Farmington Field Office w/enclosures ✓
 Navajo Nation Minerals Office, Attn: Mr. Akhtar Zaman, Director/w enclosures

MINERAL RESOURCES	
ADM	<i>DM</i>
NATV AM MIN COORD	
SOLID MIN TEAM	
PETRO MIN TEAM	<i>2</i>
O & G MIN TEAM	
ALL TEAM LEADERS	
LAND RESOURCES	
ENVIRONMENT	
FILES	

ExxonMobil Production Company
U.S. West
P.O. Box 4358
Houston, Texas 77210-4358

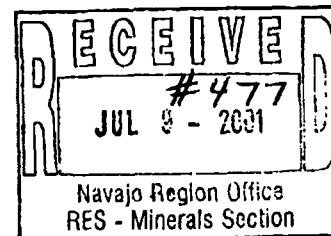
pb 7/12/01
SN
543
File

June 27, 2001

ExxonMobil
Production

Certified Mail
Return Receipt Requested

Ms. Genni Denetsone
United States Department of the Interior
Bureau of Indian Affairs, Navajo Region
Real Estate Services
P. O. Box 1060
Gallup, New Mexico 87305-1060
Mail Code 543



Change of Name –
Mobil Oil Corporation to
ExxonMobil Oil Corporation

Dear Ms. Denetsone:

Effective June 1, 2001, Mobil Oil Corporation (MOC) changed its name to ExxonMobil Oil Corporation (EMOC). This was a name change only; EMOC is the same corporation as Mobil Oil Corporation, but with a new name. No facility or other asset was transferred from one corporation to another by virtue of the name change. Specifically, EMOC will remain the owner and operator of its existing exploration and production oil and gas properties and facilities, as well as relevant permits.

There is no change to the name of Exxon Mobil Corporation, the ultimate shareholder of EMOC.

Please note the change of name of MOC to ExxonMobil Oil Corporation in your records pertaining to any MOC permits.

The Federal Identification Number for MOC (13-5401570) will remain the same for EMOC.

Attached is the Name Change Certification, Current listing of Officers and Directors, Filing Fee of \$75/-, Listing of Leases, Financial Statement and a copy of the Rider for Bond number 8027 31 97. The original Bond Rider has been sent to Ms. Barbar Davis at your Washington Office.

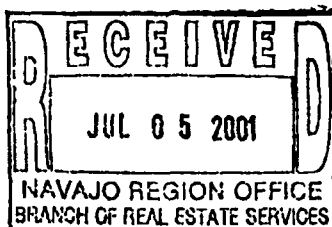
If you have any questions, please contact Alex Correa at (713) 431-1012.

Very truly yours,

Charlotte H. Harper

Charlotte H. Harper
Permitting Supervisor

Attachments



ExxonMobil Production Company
a division of Exxon Mobil Corporation,
acting for ExxonMobil Oil Corporation

NOTE: Check forwarded to Ella Isaac

Bureau of Indian Affairs
Navajo Region Office
Attn: RRES - Mineral and Mining Section
P.O. Box 1060
Gallup, New Mexico 87305-1060

Gentlemen:

The current listing of officers and director of ExxonMobil Oil Corporation (Name of Corporation), of New York (State) is as follows:

OFFICERS

President	<u>F.A. Risch</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>
Vice President	<u>K.T. Koonce</u>	Address <u>800 Bell Street Houston, TX 77002</u>
Secretary	<u>F.L. Reid</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>
Treasure	<u>B.A. Maher</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>

DIRECTORS

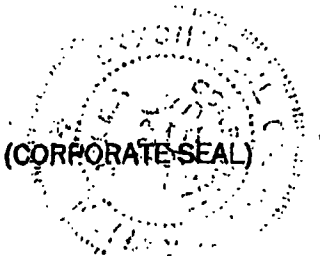
Name	<u>D.D. Humphreys</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>
Name	<u>P.A. Hanson</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>
Name	<u>T.P. Townsend</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>
Name	<u>B.A. Maher</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>
Name	<u>F.A. Risch</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>


Sincerely,



Alex Correa

This is to certify that the above information pertaining to ExxonMobil Oil Corporation (Corporation) is true and correct as evidenced by the records and accounts covering business for the State of Utah and in the custody of Corporation Service Company (Agent), Phone: 1 (800) 927-9800, whose business address is One Utah Center, 201 South Main Street, Salt Lake City, Utah 84111-2218




Signature
AGENT AND ATTORNEY IN FACT
Title

SAL

CERTIFICATION

I, the undersigned Assistant Secretary of ExxonMobil Oil Corporation. (formerly Mobil Oil Corporation), a corporation organized and existing under the laws of the State of New York, United States of America, DO HEREBY CERTIFY, That, the following is a true and exact copy of the resolutions adopted by the Board of Directors on May 22, 2001:

CHANGE OF COMPANY NAME

WHEREAS, the undersigned Directors of the Corporation deem it to be in the best interest of the Corporation to amend the Certificate of Incorporation of the Corporation to change the name and principal office of the Corporation:

NOW THEREFORE BE IT RESOLVED, That Article 1st relating to the corporate name is hereby amended to read as follows:

"1st The corporate name of said Company shall be,

ExxonMobil Oil Corporation",

FURTHER RESOLVED, That the amendment of the Corporation's Certificate of Incorporation referred to in the preceding resolutions be submitted to the sole shareholder of the Corporation entitled to vote thereon for its approval and, if such shareholder gives its written consent, pursuant to Section 803 of the Business Corporation Law of the State of New York, approving such amendment, the proper officers of the Corporation be, and they hereby are, authorized to execute in the name of the Corporation the Certificate of Amendment of Certificate of Incorporation, in the form attached hereto;

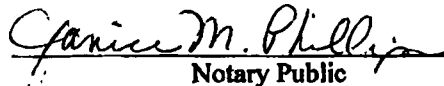
FURTHER RESOLVED, That the proper officers of the Corporation be and they hereby are authorized and directed to deliver, file and record in its behalf, the Certificate of Amendment of Certificate of Incorporation, and to take such action as may be deemed necessary or advisable to confirm and make effective in all respects the change of this Company's name to EXXONMOBIL OIL CORPORATION.

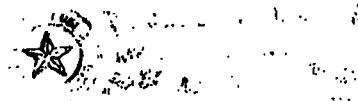
WITNESS, my hand and the seal of the Corporation at Irving, Texas, this 8th day of June, 2001.


Assistant Secretary

COUNTY OF DALLAS)
STATE OF TEXAS)
UNITED STATES OF AMERICA)

Sworn to and subscribed before me at Irving, Texas, U. S. A. on this the 8th day of June, 2001.


Notary Public



LISTING OF LEASES OF MOBIL OIL CORPORATION**Lease Number**

- 1) 14-20-0603-6504
- 2) 14-20-0603-6505
- 3) 14-20-0603-6506
- 4) 14-20-0603-6508
- 5) 14-20-0603-6509
- 6) 14-20-0603-6510
- 7) 14-20-0603-7171
- 8) 14-20-0603-7172A
- 9) 14-20-600-3530
- 10) 14-20-603-359
- 11) 14-20-603-368
- 12) 14-20-603-370
- 13) 14-20-603-370A
- 14) 14-20-603-372
- 15) 14-20-603-372A
- 16) 14-20-603-4495
- 17) 14-20-603-5447
- 18) 14-20-603-5448
- 19) 14-20-603-5449
- 20) 14-20-603-5450
- 21) 14-20-603-5451

6/1/01

CHUBB GROUP OF INSURANCE COMPANIES

1000 West Loop South, Suite 1400, Houston, Texas 77027-3301
Telephone: (713) 297-4600 • Facsimile: (713) 297-4750

NW Bond

FEDERAL INSURANCE COMPANY RIDER
to be attached to and form a part of

BOND NO 8027 31 97
wherein

Mobil Oil Corporation and Mobil Exploration and Producing U.S., Inc. is
named as Principal and

FEDERAL INSURANCE COMPANY AS SURETY,

in favor of United States of America, Department of the Interior
Bureau of Indian Affairs

in the amount of \$150,000.00
bond date: 11/01/65

IT IS HEREBY UNDERSTOOD AND AGREED THAT effective June 1, 2001
the name of the Principal is changed

FROM: Mobil Oil Corporation and Mobil Exploration and Producing U.S., Inc.

TO : ExxonMobil Oil Corporation

All other terms and conditions of this Bond are unchanged.

Signed, sealed and dated this 12th of June, 2001.

ExxonMobil Oil Corporation

By: 

FEDERAL INSURANCE COMPANY

By: 

Mary Pierson, Attorney-in-fact

**Chubb
Surety****POWER
OF
ATTORNEY****Federal Insurance Company
Vigilant Insurance Company
Pacific Indemnity Company****Attn.: Surety Department
15 Mountain View Road
Warren, NJ 07059**

Know All by These Presents, That **FEDERAL INSURANCE COMPANY**, an Indiana corporation, **VIGILANT INSURANCE COMPANY**, a New York corporation, and **PACIFIC INDEMNITY COMPANY**, a Wisconsin corporation, do each hereby constitute and appoint **R.F. Bobo, Mary Pierson, Philana Berros, and Jody E. Specht of Houston, Texas-----**

each as their true and lawful Attorney-in-Fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligatory in the nature thereof (other than bail bonds) given or executed in the course of business, and any instruments amending or altering the same, and consents to the modification or alteration of any instrument referred to in said bonds or obligations.

In Witness Whereof, said **FEDERAL INSURANCE COMPANY**, **VIGILANT INSURANCE COMPANY**, and **PACIFIC INDEMNITY COMPANY** have each executed and attested these presents and affixed their corporate seals on this 10th day of May, 2001.


Kenneth C. Wendel, Assistant Secretary


Frank E. Robertson, Vice President


STATE OF NEW JERSEY } ss.
County of Somerset

On this 10th day of May, 2001, before me, a Notary Public of New Jersey, personally came Kenneth C. Wendel, to me known to be Assistant Secretary of **FEDERAL INSURANCE COMPANY**, **VIGILANT INSURANCE COMPANY**, and **PACIFIC INDEMNITY COMPANY**, the companies which executed the foregoing Power of Attorney, and the said Kenneth C. Wendel being by me duly sworn, did depose and say that he is Assistant Secretary of **FEDERAL INSURANCE COMPANY**, **VIGILANT INSURANCE COMPANY**, and **PACIFIC INDEMNITY COMPANY** and knows the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such corporate seals and were thereto affixed by authority of the By-Laws of said Companies; and that he signed said Power of Attorney as Assistant Secretary of said Companies by like authority; and that he is acquainted with Frank E. Robertson, and knows him to be Vice President of said Companies; and that the signature of Frank E. Robertson, subscribed to said Power of Attorney is in the genuine handwriting of Frank E. Robertson, and was thereto subscribed by authority of said Companies in the deponent's presence.



Notary Public State of New Jersey
No. 2231647

Commission Expires Oct 28, 2004


Notary Public

Extract from the By-Laws of **FEDERAL INSURANCE COMPANY**, **VIGILANT INSURANCE COMPANY**, and **PACIFIC INDEMNITY COMPANY**:

"All powers of attorney for and on behalf of the Company may and shall be executed in the name and on behalf of the Company, either by the Chairman or the President or a Vice President or an Assistant Vice President, jointly with the Secretary or an Assistant Secretary, under their respective designations. The signature of such officers may be engraved, printed or lithographed. The signature of each of the following officers: Chairman, President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary and the seal of the Company may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such power of attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached."

I, Kenneth C. Wendel, Assistant Secretary of **FEDERAL INSURANCE COMPANY**, **VIGILANT INSURANCE COMPANY**, and **PACIFIC INDEMNITY COMPANY** (the "Companies") do hereby certify that

- (i) the foregoing extract of the By-Laws of the Companies is true and correct,
- (ii) the Companies are duly licensed and authorized to transact surety business in all 50 of the United States of America and the District of Columbia and are authorized by the U. S. Treasury Department; further, Federal and Vigilant are licensed in Puerto Rico and the U. S. Virgin Islands, and Federal is licensed in American Samoa, Guam, and each of the Provinces of Canada except Prince Edward Island; and
- (iii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Warren, NJ this 12th day of June, 2001.




Kenneth C. Wendel, Assistant Secretary

IN THE EVENT YOU WISH TO NOTIFY US OF A CLAIM, VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT ADDRESS LISTED ABOVE, OR BY
Telephone (908) 903-3485 Fax (908) 903-3656 e-mail: surety@chubb.com

CSC.

5184334741

06/01 '01 08:46 NO.410 03/05

CSC.

06/01 '01 09:06 NO.135 02/04

F010601000187

**CERTIFICATE OF AMENDMENT
OF
CERTIFICATE OF INCORPORATION
OF
MOBIL OIL CORPORATION**

CSC 45

(Under Section 805 of the Business Corporation Law)

Pursuant to the provisions of Section 805 of the Business Corporation Law, the undersigned President and Secretary, respectively, of Mobil Oil Corporation hereby certify:

FIRST: That the name of the corporation is **MOBIL OIL CORPORATION** and that said corporation was incorporated under the name of Standard Oil Company of New York.

SECOND: That the Certificate of Incorporation of the corporation was filed by the Department of State, Albany, New York, on the 10th day of August, 1882.

THIRD: That the amendments to the Certificate of Incorporation effected by this Certificate are as follows:

(a) Article 1st of the Certificate of Incorporation, relating to the corporate name, is hereby amended to read as follows:

"1st The corporate name of said Company shall be,
ExxonMobil Oil Corporation,"

(b) Article 7th of the Certificate of Incorporation, relating to the office of the corporation is hereby amended to read as follows:

The office of the corporation within the State of New York is to be located in the County of Albany. The Company shall have offices at such other places as the Board of Directors may from time to time determine.

CSC
CSC

5184334741

06/01 '01 08:47 NO.410 04/05
06/01 '01 07:06 NO.133 03/04

FOURTH: That the amendments to the Certificate of Incorporation were authorized by the Board of Directors followed by the holder of all outstanding shares entitled to vote on amendments to the Certificate of Incorporation by written consent of the sole shareholder dated May 22, 2001.

IN WITNESS WHEREOF, this Certificate has been signed this 22nd Day of May, 2001.



F. A. Ritch, President

STATE OF TEXAS)
COUNTY OF DALLAS)

F. L. REID, being duly sworn, deposes and says that he is the Secretary of MOBIL OIL CORPORATION, the corporation mentioned and described in the foregoing instrument; that he has read and signed the same and that the statements contained therein are true.



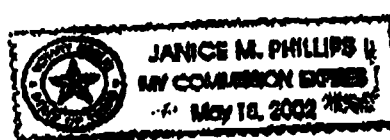
F. L. REID, Secretary

SUBSCRIBED AND SWORN TO before me, the undersigned authority, on this the 22nd day of May, 2001.

[SEAL]



NOTARY PUBLIC, STATE OF TEXAS



=> CSC

.TEL=5184334741

06/01'01 08:19

CSC
CSC

5184334741

06/01 '01 09:01 NO. 411 02/02
06/01 '01 09:00 NO. 133 04/04
F010601000187**CSC 45****CERTIFICATE OF AMENDMENT****OF****MOBIL OIL CORPORATION**

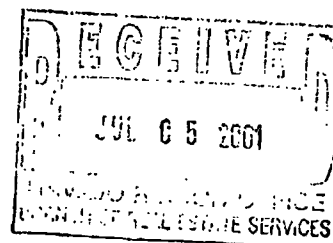
Under Section 805 of the Business Corporation Law

**STATE OF NEW YORK
DEPARTMENT OF STATE**Filed by: EXXONMOBIL CORPORATION
(Name)

FILED JUN 01 2001

6949 Las Colinas Blvd.
(Mailing address)

TAX \$

BY: *SAC*Irving, TX 75039-2298
(City, State and Zip code)*Cust Ref # 165578 MPJ***010601000195**

=> CSC

TEL=5184334741

06/01'01 08:19

State of New York }
Department of State } ss:

I hereby certify that the annexed copy has been compared with the original document in the custody of the Secretary of State and that the same is a true copy of said original.

Witness my hand and seal of the Department of State on **JUN 01 2001**



A handwritten signature in black ink, appearing to read "J. Leuch", followed by a long horizontal line.

Special Deputy Secretary of State

OPERATOR CHANGE WORKSHEET

ROUTING

1. GLH
2. CDW
3. FILE

Change of Operator (Well Sold)

Designation of Agent

X Operator Name Change

Merger

The operator of the well(s) listed below has changed, effective: **06-01-2001**

FROM: (Old Operator):	TO: (New Operator):
MOBIL EXPLORATION & PRODUCTION	EXXONMOBIL OIL CORPORATION
Address: P O BOX DRAWER "G"	Address: U S WEST P O BOX 4358
CORTEZ, CO 81321	HOUSTON, TX 77210-4358
Phone: 1-(970)-564-5212	Phone: 1-(713)-431-1010
Account No. N7370	Account No. N1855

CA No.

Unit:

RATHERFORD

WELL(S)

NAME	SEC TWN RNG	API NO	ENTITY NO	LEASE TYPE	WELL TYPE	WELL STATUS
NAVAJO A-9 (RATHERFORD 16W23)	16-41S-24E	43-037-15722	99990	INDIAN	WI	A
NAVAJO A-12 (RATHERFORD 16W21)	16-41S-24E	43-037-16414	99990	INDIAN	WI	A
RATHERFORD 16W43	16-41S-24E	43-037-16415	99990	INDIAN	WI	A
RATHERFORD 17-W-12	17-41S-24E	43-037-15726	6280	INDIAN	WI	A
17-14	17-41S-24E	43-037-15727	6280	INDIAN	WI	A
RATHERFORD 17-W-23	17-41S-24E	43-037-15728	6280	INDIAN	WI	A
17-32	17-41S-24E	43-037-15729	6280	INDIAN	WI	A
17-34	17-41S-24E	43-037-15730	6280	INDIAN	WI	A
17-41	17-41S-24E	43-037-15731	6280	INDIAN	WI	I
RATHERFORD 17-W-21	17-41S-24E	43-037-16416	99990	INDIAN	WI	A
RATHERFORD 17W43	17-41S-24E	43-037-16417	99990	INDIAN	WI	A
RATHERFORD 18-W-14	18-41S-24E	43-037-15735	6280	INDIAN	WI	A
18-W-32	18-41S-24E	43-037-15736	6280	INDIAN	WI	A
RATHERFORD 18-W-34	18-41S-24E	43-037-15737	6280	INDIAN	WI	A
DESERT A-4 (RATHERFORD 18W41)	18-41S-24E	43-037-15738	99990	INDIAN	WI	A
DESERT A-3 (RATHERFORD 18-W-21)	18-41S-24E	43-037-16418	99990	INDIAN	WI	A
18-23	18-41S-24E	43-037-30244	6280	INDIAN	WI	A
RATHERFORD U 18-W-12 (SDTRK)	18-41S-24E	43-037-31153	6280	INDIAN	WI	A
RATHERFORD UNIT 18-W-43B	18-41S-24E	43-037-31718	6280	INDIAN	WI	A
RATHERFORD U 19-W-12	19-41S-24E	43-037-15739	6280	INDIAN	WI	A

OPERATOR CHANGES DOCUMENTATION

Enter date after each listed item is completed

1. (R649-8-10) Sundry or legal documentation was received from the **FORMER** operator on: 06/29/2001
2. (R649-8-10) Sundry or legal documentation was received from the **NEW** operator on: 06/29/2001
3. The new company has been checked through the **Department of Commerce, Division of Corporations Database** on: 04/09/2002
4. Is the new operator registered in the State of Utah: YES Business Number: 579865-0143
5. If **NO**, the operator was contacted on: N/A

6. **Federal and Indian Lease Wells:** The BLM and or the BIA has approved the merger, name change, or operator change for all wells listed on Federal or Indian leases on: BIA-06/01/01

7. **Federal and Indian Units:**

The BLM or BIA has approved the successor of unit operator for wells listed on: 06/01/2001

8. **Federal and Indian Communization Agreements ("CA"):**

The BLM or BIA has approved the operator for all wells listed within a CA on: N/A

9. **Underground Injection Control ("UIC")** The Division has approved UIC Form 5, **Transfer of Authority to Inject**, for the enhanced/secondary recovery unit/project for the water disposal well(s) listed on: N/A

NOTE: EPA ISSUES UIC PERMIT

DATA ENTRY:

1. Changes entered in the **Oil and Gas Database** on: 04/11/2002
2. Changes have been entered on the **Monthly Operator Change Spread Sheet** on: 04/11/2002
3. Bond information entered in RBDMS on: N/A
4. Fee wells attached to bond in RBDMS on: N/A

STATE WELL(S) BOND VERIFICATION:

1. State well(s) covered by Bond Number: N/A

FEDERAL WELL(S) BOND VERIFICATION:

1. Federal well(s) covered by Bond Number: N/A

INDIAN WELL(S) BOND VERIFICATION:

1. Indian well(s) covered by Bond Number: 80273197

FEE WELL(S) BOND VERIFICATION:

1. (R649-3-1) The **NEW** operator of any fee well(s) listed covered by Bond Number N/A
2. The **FORMER** operator has requested a release of liability from their bond on: N/A
The Division sent response by letter on: N/A

LEASE INTEREST OWNER NOTIFICATION:

3. (R649-2-10) The **FORMER** operator of the fee wells has been contacted and informed by a letter from the Division of their responsibility to notify all interest owners of this change on: N/A

COMMENTS:

Division of Oil, Gas and Mining
OPERATOR CHANGE WORKSHEET

ROUTING

1. DJJ

2. CDW

X Change of Operator (Well Sold)

Operator Name Change/Merger

The operator of the well(s) listed below has changed, effective:

6/1/2006

FROM: (Old Operator):
 N1855-ExxonMobil Oil Corporation
 PO Box 4358
 Houston, TX 77210-4358
 Phone: 1 (281) 654-1936

TO: (New Operator):
 N2700-Resolute Natural Resources Company
 1675 Broadway, Suite 1950
 Denver, CO 80202
 Phone: 1 (303) 534-4600

CA No.

Unit:

RATHERFORD (UIC)

OPERATOR CHANGES DOCUMENTATION

Enter date after each listed item is completed

1. (R649-8-10) Sundry or legal documentation was received from the **FORMER** operator on: 4/21/2006
2. (R649-8-10) Sundry or legal documentation was received from the **NEW** operator on: 4/24/2006
3. The new company was checked on the **Department of Commerce, Division of Corporations Database** on: 6/7/2006
4. Is the new operator registered in the State of Utah: YES Business Number: 5733505-0143
5. If **NO**, the operator was contacted on: _____
- 6a. (R649-9-2) Waste Management Plan has been received on: requested
- 6b. Inspections of LA PA state/fee well sites complete on: n/a
- 6c. Reports current for Production/Disposition & Sundries on: ok
7. **Federal and Indian Lease Wells:** The BLM and or the BIA has approved the merger, name change, or operator change for all wells listed on Federal or Indian leases on: BLM n/a BIA not yet
8. **Federal and Indian Units:**
 The BLM or BIA has approved the successor of unit operator for wells listed on: not yet
9. **Federal and Indian Communization Agreements ("CA"):**
 The BLM or BIA has approved the operator for all wells listed within a CA on: n/a
10. **Underground Injection Control ("UIC")** The Division has approved UIC Form 5, **Transfer of Authority to Inject**, for the enhanced/secondary recovery unit/project for the water disposal well(s) listed on: 6/12/2006

DATA ENTRY:

1. Changes entered in the **Oil and Gas Database** on: 6/22/2006
2. Changes have been entered on the **Monthly Operator Change Spread Sheet** on: 6/22/2006
3. Bond information entered in RBDMS on: n/a
4. Fee/State wells attached to bond in RBDMS on: n/a
5. Injection Projects to new operator in RBDMS on: 6/22/2006
6. Receipt of Acceptance of Drilling Procedures for APD/New on: n/a

BOND VERIFICATION:

1. Federal well(s) covered by Bond Number: n/a
2. Indian well(s) covered by Bond Number: PA002769
3. (R649-3-1) The **NEW** operator of any fee well(s) listed covered by Bond Number n/a
- a. The **FORMER** operator has requested a release of liability from their bond on: n/a
 The Division sent response by letter on: n/a

LEASE INTEREST OWNER NOTIFICATION:

4. (R649-2-10) The **FORMER** operator of the fee wells has been contacted and informed by a letter from the Division of their responsibility to notify all interest owners of this change on: n/a

COMMENTS:

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

UIC FORM 5

TRANSFER OF AUTHORITY TO INJECT

Well Name and Number See attached list		API Number Attached
Location of Well		Field or Unit Name Ratherford Unit
Footage: See attached list	County: San Juan	Lease Designation and Number See attached list
QQ, Section, Township, Range:	State: UTAH	

EFFECTIVE DATE OF TRANSFER: 6/1/2006

CURRENT OPERATOR

Company: Exxon Mobil Oil Corporation Name: _____
Address: PO Box 4358 Signature: _____
city Houston state TX zip 77210-4358 Title: _____
Phone: (281) 654-1936 Date: _____
Comments: Exxon Mobil has submitted a separate, signed copy of UIC Form 5

NEW OPERATOR

Company: Resolute Natural Resources Company Name: Dwight E Mallory
Address: 1675 Broadway, Suite 1950 Signature: _____
city Denver state CO zip 80202 Title: Regulatory Coordinator
Phone: (303) 534-4600 Date: 4/20/2006
Comments: A list of affected UIC wells is attached.
New bond numbers for these wells are:
BIA Bond # PA002769 and US EPA Bond # B001252

(This space for State use only)

Transfer approved by: _____
Title: Field Operations Manager

Approval Date: 6/12/06

Comments:

RECEIVED
APR 24 2006

DIV. OF OIL, GAS & MINING

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

FORM 9

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

1. TYPE OF WELL OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <u>Unit Agreement</u>		5. LEASE DESIGNATION AND SERIAL NUMBER: <u>See attached list</u>
2. NAME OF OPERATOR: <u>Resolute Natural Resources Company</u> <u>N2700</u>		6. IF INDIAN, ALLOTTEE OR TRIBE NAME: <u>Navajo Tribe</u>
3. ADDRESS OF OPERATOR: <u>1675 Broadway, Suite 1950</u> CITY <u>Denver</u> STATE <u>CO</u> ZIP <u>80202</u>		7. UNIT or CA AGREEMENT NAME: <u>Ratherford Unit</u>
4. LOCATION OF WELL FOOTAGES AT SURFACE: <u>See attached list</u>		8. WELL NAME and NUMBER: <u>See attached list</u>
QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: <u> </u>		9. API NUMBER: <u>Attached</u>
COUNTY: <u>San Juan</u>		10. FIELD AND POOL, OR WILDCAT: <u>Greater Aneth</u>
STATE: <u>UTAH</u>		

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION		
<input type="checkbox"/> NOTICE OF INTENT (Submit in Duplicate) Approximate date work will start: _____	<input type="checkbox"/> ACIDIZE	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> REPERFORATE CURRENT FORMATION
	<input type="checkbox"/> ALTER CASING	<input type="checkbox"/> FRACTURE TREAT	<input type="checkbox"/> SIDETRACK TO REPAIR WELL
	<input type="checkbox"/> CASING REPAIR	<input type="checkbox"/> NEW CONSTRUCTION	<input type="checkbox"/> TEMPORARILY ABANDON
	<input type="checkbox"/> CHANGE TO PREVIOUS PLANS	<input checked="" type="checkbox"/> OPERATOR CHANGE	<input type="checkbox"/> TUBING REPAIR
	<input type="checkbox"/> CHANGE TUBING	<input type="checkbox"/> PLUG AND ABANDON	<input type="checkbox"/> VENT OR FLARE
<input checked="" type="checkbox"/> SUBSEQUENT REPORT (Submit Original Form Only) Date of work completion: _____	<input type="checkbox"/> CHANGE WELL NAME	<input type="checkbox"/> PLUG BACK	<input type="checkbox"/> WATER DISPOSAL
	<input type="checkbox"/> CHANGE WELL STATUS	<input type="checkbox"/> PRODUCTION (START/RESUME)	<input type="checkbox"/> WATER SHUT-OFF
	<input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS	<input type="checkbox"/> RECLAMATION OF WELL SITE	<input type="checkbox"/> OTHER: _____
	<input type="checkbox"/> CONVERT WELL TYPE	<input type="checkbox"/> RECOMPLETE - DIFFERENT FORMATION	

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

Effective June 1, 2006 Exxon Mobil Oil Corporation resigns as operator of the Ratherford Unit. Also effective June 1, 2006 Resolute Natural Resources Company is designated as successor operator of the Ratherford Unit.

A list of affected producing and water source wells is attached. A separate of affected injection wells is being submitted with UIC Form 5, Transfer of Authority to Inject.

As of the effective date, bond coverage for the affected wells will transfer to BIA Bond # PA002769.

NAME (PLEASE PRINT) Dwight E Mallory

TITLE Regulatory Coordinator

SIGNATURE Dwight E Mallory

DATE 4/20/2006

(This space for State use only)

APPROVED 6127106

Earlene Russell

Division of Oil, Gas and Mining
Earlene Russell, Engineering Technician

RECEIVED

APR 24 2006

DIV. OF OIL, GAS & MINING

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

FORM 9

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

1. TYPE OF WELL OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <u>Injection</u>		5. LEASE DESIGNATION AND SERIAL NUMBER:
2. NAME OF OPERATOR: ExxonMobil Oil Corporation <u>N1855</u>		6. IF INDIAN, ALLOTTEE OR TRIBE NAME: <u>Ship Rock</u>
3. ADDRESS OF OPERATOR: P.O. Box 4358 CITY <u>Houston</u> STATE <u>TX</u> ZIP <u>77210-4358</u>		7. UNIT or CA AGREEMENT NAME: <u>UTU68931A</u>
4. LOCATION OF WELL FOOTAGES AT SURFACE: QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN:		8. WELL NAME and NUMBER: <u>Ratherford</u>
PHONE NUMBER: <u>(281) 654-1936</u>		9. API NUMBER: <u>attached</u>
		10. FIELD AND POOL, OR WILDCAT: <u>Aneth</u>

COUNTY: San Juan

STATE: UTAH

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION		
<input checked="" type="checkbox"/> NOTICE OF INTENT (Submit in Duplicate) Approximate date work will start: <u>6/1/2006</u>	<input type="checkbox"/> ACIDIZE	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> REPERFORATE CURRENT FORMATION
	<input type="checkbox"/> ALTER CASING	<input type="checkbox"/> FRACTURE TREAT	<input type="checkbox"/> SIDETRACK TO REPAIR WELL
	<input type="checkbox"/> CASING REPAIR	<input type="checkbox"/> NEW CONSTRUCTION	<input type="checkbox"/> TEMPORARILY ABANDON
	<input type="checkbox"/> CHANGE TO PREVIOUS PLANS	<input checked="" type="checkbox"/> OPERATOR CHANGE	<input type="checkbox"/> TUBING REPAIR
	<input type="checkbox"/> CHANGE TUBING	<input type="checkbox"/> PLUG AND ABANDON	<input type="checkbox"/> VENT OR FLARE
<input type="checkbox"/> SUBSEQUENT REPORT (Submit Original Form Only) Date of work completion:	<input type="checkbox"/> CHANGE WELL NAME	<input type="checkbox"/> PLUG BACK	<input type="checkbox"/> WATER DISPOSAL
	<input type="checkbox"/> CHANGE WELL STATUS	<input type="checkbox"/> PRODUCTION (START/RESUME)	<input type="checkbox"/> WATER SHUT-OFF
	<input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS	<input type="checkbox"/> RECLAMATION OF WELL SITE	<input type="checkbox"/> OTHER: _____
	<input type="checkbox"/> CONVERT WELL TYPE	<input type="checkbox"/> RECOMPLETE - DIFFERENT FORMATION	

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

ExxonMobil Oil Corporation is transferring operatorship of Greater Aneth field, Ratherford lease to Resolute Natural Resources Company. All change of operator notices should be made effective as of 7:00 AM MST on June 1, 2006.

Attached please find a listing of injection wells included in the transfer.

NAME (PLEASE PRINT) <u>Laurie Kilbride</u>	TITLE <u>Permitting Supervisor</u>
SIGNATURE <u>Laurie Kilbride</u>	DATE <u>4/19/2006</u>

(This space for State use only)

APPROVED 6/27/06
Earlene Russell
Division of Oil, Gas and Mining
Earlene Russell, Engineering Technician
(See Instructions on Reverse Side)

RECEIVED
APR 21 2006

GREATER ANETH FIELD UIC WELL LIST
Ratherford lease, San Juan County, Utah

Reg Lease Name	Well ID	API Num	Status	Reg Lease #	Surface Location							
					Qtr 1	Qtr 2	Sec	TN	RNG	NS Foot	EW Foot	
RATHERFORD UNIT	1W24	430371583900S1	Shut-in	14-20-603-246A	NE	SE	1	41S	23E	0651FSL	3300FEL	
RATHERFORD UNIT	2W44	430371638600S1	Active	14-20-603-246A	SE	SE	2	41S	23E	0810FSL	0510FEL	
RATHERFORD UNIT	11W42	430371584100S1	Active	14-20-603-246A	SE	NE	11	41S	23E	3290FSL	4617FWL	
RATHERFORD UNIT	11W44	430371584200S1	Shut-in	14-20-603-246A	SE	SE	11	41S	23E	0660FSL	0558FEL	
RATHERFORD UNIT	12W11	430371584300S1	Active	14-20-603-246A	NW	NW	12	41S	23E	0678FNL	4620FEL	
RATHERFORD UNIT	12W13	430371640400S1	Active	14-20-603-246A	NW	SW	12	41S	23E	1980FSL	4620FEL	
RATHERFORD UNIT	12W22	430371584501S1	Active	14-20-603-246A	SE	NW	12	41S	23E	1920FNL	2080FWL	
RATHERFORD UNIT	12W24	430373115101S1	Active	14-20-603-246A	SE	SW	12	41S	23E	0775FSL	1980FWL	
RATHERFORD UNIT	12W31	430371584700S1	Active	14-20-603-246A	NW	NE	12	41S	23E	0661FNL	1981FEL	
RATHERFORD UNIT	12W33	430371584800S1	Active	14-20-603-246A	NW	SE	12	41S	23E	1958FSL	3300FEL	
RATHERFORD UNIT	12W42	430371585000S1	Active	14-20-603-246A	SE	NE	12	41S	23E	3275FSL	0662FEL	
RATHERFORD UNIT	12W44A	430373154300S1	Shut-in	14-20-603-246A	SE	SE	12	41S	23E	0772FSL	0807FEL	
RATHERFORD UNIT	13W11	430373115201S1	Active	14-20-603-247A	NW	NW	13	41S	23E	0500FNL	0660FWL	
RATHERFORD UNIT	13W13	430371585100S1	Active	14-20-603-247A	NW	SW	13	41S	23E	1980FSL	4620FEL	
RATHERFORD UNIT	13W22	430371585200S1	Active	14-20-603-247A	SE	NW	13	41S	23E	1988FNL	3300FEL	
RATHERFORD UNIT	13W24	430371585300S1	Active	14-20-603-247A	SE	SW	13	41S	23E	0660FSL	3300FEL	
RATHERFORD UNIT	13W33	430371585501S1	Active	14-20-603-247A	NW	SE	13	41S	23E	1970FSL	1979FEL	
RATHERFORD UNIT	13W42	430371585700S1	Shut-in	14-20-603-247A	SE	NE	13	41S	23E	2139FNL	0585FEL	
RATHERFORD UNIT	13W44	430371640700S1	Active	14-20-603-247A	SE	SE	13	41S	23E	0653FSL	0659FEL	
RATHERFORD UNIT	14-31	430373171700S1	Active	14-20-603-247A	NW	NE	14	41S	23E	0754FNL	1604FEL	
RATHERFORD UNIT	14W42	430371586001S1	Active	14-20-603-247A	SE	NE	14	41S	23E	1976FNL	653FEL	
RATHERFORD UNIT	24W31	430371586200S1	Shut-in	14-20-603-247A	NW	NE	24	41S	24E	0560FNL	1830FEL	
RATHERFORD UNIT	24W42	430371586300S1	Shut-in	14-20-603-247A	SE	NE	24	41S	24E	1980FNL	0660FEL	
RATHERFORD UNIT	17W12	430371572601S1	Active	14-20-603-353	SW	NW	17	41S	24E	1980FNL	510FWL	
RATHERFORD UNIT	17W14	430371572700S1	Active	14-20-603-353	SW	SW	17	41S	24E	0610FSL	0510FWL	
RATHERFORD UNIT	17W21	430371641601S1	Active	14-20-603-353	NE	NW	17	41S	24E	0510FNL	1830FWL	
RATHERFORD UNIT	17W23	430371572801S1	Active	14-20-603-353	NE	SW	17	41S	24E	1880FSL	1980FWL	
RATHERFORD UNIT	17W32	430371572900S1	TA'd	14-20-603-353	SW	NE	17	41S	24E	1830FNL	2030FEL	
RATHERFORD UNIT	17W34	430371573000S1	Active	14-20-603-353	SW	SE	17	41S	24E	0560FSL	1880FEL	
RATHERFORD UNIT	17W41	430371573100S1	Shut-in	14-20-603-353	NE	NE	17	41S	24E	0610FNL	0510FEL	
RATHERFORD UNIT	17W43	430371641701S1	Active	14-20-603-353	NE	SE	17	41S	24E	1980FSL	0660FEL	
RATHERFORD UNIT	18-43B	430373171801S1	Active	14-20-603-353	NE	SE	18	41S	24E	2023FSL	0651FEL	
RATHERFORD UNIT	18W12	430373115301S1	Active	14-20-603-353	SW	NW	18	41S	24E	1980FNL	560FWL	
RATHERFORD UNIT	18W14	430371573501S1	Active	14-20-603-353	SW	SW	18	41S	24E	0810FSL	0600FWL	
RATHERFORD UNIT	18W21	430371641801S1	Active	14-20-603-353	NE	NW	18	41S	24E	660FNL	1882FWL	
RATHERFORD UNIT	18W23	430373024400S1	Shut-in	14-20-603-353	NE	SW	18	41S	24E	2385FSL	2040FWL	
RATHERFORD UNIT	18W32	430371573601S1	Active	14-20-603-353	SW	NE	18	41S	24E	2140FNL	1830FEL	
RATHERFORD UNIT	18W34	430371573701S1	Active	14-20-603-353	SW	SE	18	41S	24E	780FSL	1860FEL	
RATHERFORD UNIT	18W41	430371573800S1	TA'd	14-20-603-353	NE	NE	18	41S	24E	0660FNL	0660FEL	
RATHERFORD UNIT	19-12	430371573901S1	Active	14-20-603-353	SW	NW	19	41S	24E	1980FNL	0600FWL	
RATHERFORD UNIT	19-32	430371574301S1	Active	14-20-603-353	SW	NE	19	41S	24E	2717FNL	2802FEL	
RATHERFORD UNIT	19-34	430371574401S1	Active	14-20-603-353	SW	SE	19	41S	24E	0660FSL	1980FEL	
RATHERFORD UNIT	19W21	430371574100S1	Shut-in	14-20-603-353	NE	NW	19	41S	24E	0660FNL	1860FWL	
RATHERFORD UNIT	19W23	430371574200S1	Shut-in	14-20-603-353	NE	SW	19	41S	24E	2080FSL	1860FWL	
RATHERFORD UNIT	19W43	430371642000S1	Shut-in	14-20-603-353	NE	SE	19	41S	24E	1980FSL	0760FEL	
RATHERFORD UNIT	20-12	430371574601S1	Active	14-20-603-353	SW	NW	20	41S	24E	0709FNL	0748FEL	
RATHERFORD UNIT	20-14	430371574701S1	Active	14-20-603-353	SW	SW	20	41S	24E	0660FSL	0660FWL	
RATHERFORD UNIT	20-32	430371574901S1	Active	14-20-603-353	SW	NE	20	41S	24E	0037FNL	0035FWL	
RATHERFORD UNIT	20-34	430371575001S1	Active	14-20-603-353	SW	SE	20	41S	24E	0774FNL	0617FWL	
RATHERFORD UNIT	20-67	430373159000S1	Active	14-20-603-353	NE	SW	20	41S	24E	2629FSL	1412FWL	
RATHERFORD UNIT	20W21	430371642300S1	Active	14-20-603-353	NE	NW	20	41S	24E	0660FNL	1880FWL	
RATHERFORD UNIT	20W23	430371574800S1	Active	14-20-603-353	NW	SW	20	41S	24E	2080FSL	2120FWL	
RATHERFORD UNIT	20W41	430371575100S1	Active	14-20-603-353	NE	NE	20	41S	24E	0660FNL	0660FEL	
RATHERFORD UNIT	20W43	430371642400S1	TA'd	14-20-603-353	NE	SE	20	41S	24E	2070FSL	0810FEL	
RATHERFORD UNIT	16W12	430371572000S1	Active	14-20-603-355	SW	NW	16	41S	24E	1880FNL	0660FWL	

GREATER ANETH FIELD UIC WELL LIST
Ratherford lease, San Juan County, Utah

Reg Lease Name	Well ID	API Num	Status	Reg Lease #	Surface Location						
					Qtr 1	Qtr 2	Sec	TN	RNG	NS Foot	EW Foot
RATHERFORD UNIT	16W14	430371572100S1	Shut-in	14-20-603-355	SW	SW	16	41S	24E	0660FSL	0660FWL
RATHERFORD UNIT	16W21	430371641400S1	Active	14-20-603-355	NE	NW	16	41S	24E	0660FNL	1880FWL
RATHERFORD UNIT	16W23	430371572201S1	Active	14-20-603-355	NE	SW	16	41S	24E	1980FSL	1980FWL
RATHERFORD UNIT	16W43	430371641501S1	Active	14-20-603-355	NE	SE	16	41S	24E	2140FSL	0820FEL
RATHERFORD UNIT	21-14	430371575301S1	Active	14-20-603-355	SW	SW	21	41S	24E	0660FSL	0460FWL
RATHERFORD UNIT	21-67	430373175301S1	Active	14-20-603-355	NE	SW	21	41S	24E	2560FSL	1325FWL
RATHERFORD UNIT	21W21	430371642501S1	Active	14-20-603-355	NE	NW	21	41S	24E	0660FNL	2030FWL
RATHERFORD UNIT	6W14	430371598400S1	Active	14-20-603-368	NE	SE	6	41S	24E	0660FSL	0660FWL
RATHERFORD UNIT	7W12	430371598500S1	Active	14-20-603-368	NE	SE	7	41S	24E	2140FNL	0585FWL
RATHERFORD UNIT	7W14	430371598600S1	Active	14-20-603-368	NE	SE	7	41S	24E	1065FSL	0660FWL
RATHERFORD UNIT	7W21	430371639400S1	Active	14-20-603-368	NE	NW	7	41S	24E	0710FNL	1820FWL
RATHERFORD UNIT	7W34	430371598900S1	Active	14-20-603-368	SW	SE	7	41S	24E	0710FSL	2003FEL
RATHERFORD UNIT	7W43	430371639500S1	Active	14-20-603-368	NE	SE	7	41S	24E	2110FSL	0660FEL
RATHERFORD UNIT	8W14	430371599200S1	Active	14-20-603-368	SW	NE	8	41S	24E	0745FSL	0575FWL
RATHERFORD UNIT	10W43	430371640300S1	TA'd	14-20-603-4037	NE	SE	10	41S	24E	1980FSL	0550FEL
RATHERFORD UNIT	29-12	430371533701S1	Active	14-20-603-407	SW	NW	29	41S	24E	2870FNL	1422FWL
RATHERFORD UNIT	29-32	430371533901S1	Active	14-20-603-407	SW	NE	29	41S	24E	0694FNL	0685FWL
RATHERFORD UNIT	29W21	430371643200S1	Active	14-20-603-407	NE	NW	29	41S	24E	0667FNL	2122FWL
RATHERFORD UNIT	29W41	430371643300S1	Active	14-20-603-407	NE	NE	29	41S	24E	0557FNL	0591FEL
RATHERFORD UNIT	29W43	430371643400S1	Shut-in	14-20-603-407	NE	SE	29	41S	24E	1980FSL	0660FEL
RATHERFORD UNIT	30W41	430371534300S1	Shut-in	14-20-603-407	NE	NE	30	41S	24E	0660FNL	0660FEL
RATHERFORD UNIT	28-12	430371533601S1	Active	14-20-603-409	SW	SE	28	41S	24E	2121FNL	0623FWL
RATHERFORD UNIT	28W21	430371643100S1	Shut-in	14-20-603-409	NE	NW	28	41S	24E	0660FNL	2022FWL
RATHERFORD UNIT	9W23	430371639800S1	Active	14-20-603-5046	NW	SE	9	41S	24E	1980FSL	1980FWL

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES DIVISION OF OIL, GAS, AND MINING		FORM 9			
SUNDRY NOTICES AND REPORTS ON WELLS Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.		5. LEASE DESIGNATION AND SERIAL NUMBER: 14-20-603-353			
1. TYPE OF WELL Water Injection Well		6. IF INDIAN, ALLOTTEE OR TRIBE NAME: NAVAJO			
2. NAME OF OPERATOR: RESOLUTE NATURAL RESOURCES		7. UNIT or CA AGREEMENT NAME: RATHERFORD			
3. ADDRESS OF OPERATOR: 1675 Boradway Ste 1950 , Denver, CO, 80202		8. WELL NAME and NUMBER: RATHERFORD U 18-W-12 (SDTRK)			
4. LOCATION OF WELL FOOTAGES AT SURFACE: 1980 FNL 0560 FWL QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: Qtr/Qtr: SWNW Section: 18 Township: 41.0S Range: 24.0E Meridian: S		9. API NUMBER: 43037311530000			
9. FIELD and POOL or WILDCAT: GREATER ANETH		COUNTY: SAN JUAN			
STATE: UTAH					
11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA					
TYPE OF SUBMISSION <input checked="" type="checkbox"/> NOTICE OF INTENT Approximate date work will start: 9/24/2013 <input type="checkbox"/> SUBSEQUENT REPORT Date of Work Completion: <input type="checkbox"/> SPUD REPORT Date of Spud: <input type="checkbox"/> DRILLING REPORT Report Date:	TYPE OF ACTION <table style="width: 100%; border: none;"> <tr> <td style="width: 33%; vertical-align: top;"> <input type="checkbox"/> ACIDIZE <input type="checkbox"/> CHANGE TO PREVIOUS PLANS <input type="checkbox"/> CHANGE WELL STATUS <input type="checkbox"/> DEEPEN <input type="checkbox"/> OPERATOR CHANGE <input type="checkbox"/> PRODUCTION START OR RESUME <input type="checkbox"/> REPERFORATE CURRENT FORMATION <input checked="" type="checkbox"/> TUBING REPAIR <input type="checkbox"/> WATER SHUTOFF <input type="checkbox"/> WILDCAT WELL DETERMINATION </td> <td style="width: 33%; vertical-align: top;"> <input type="checkbox"/> ALTER CASING <input type="checkbox"/> CHANGE TUBING <input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> PLUG AND ABANDON <input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> SIDETRACK TO REPAIR WELL <input type="checkbox"/> VENT OR FLARE <input type="checkbox"/> SI TA STATUS EXTENSION <input type="checkbox"/> OTHER </td> <td style="width: 33%; vertical-align: top;"> <input type="checkbox"/> CASING REPAIR <input type="checkbox"/> CHANGE WELL NAME <input type="checkbox"/> CONVERT WELL TYPE <input type="checkbox"/> NEW CONSTRUCTION <input type="checkbox"/> PLUG BACK <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> APD EXTENSION OTHER: <input style="width: 100px;" type="text"/> </td> </tr> </table>		<input type="checkbox"/> ACIDIZE <input type="checkbox"/> CHANGE TO PREVIOUS PLANS <input type="checkbox"/> CHANGE WELL STATUS <input type="checkbox"/> DEEPEN <input type="checkbox"/> OPERATOR CHANGE <input type="checkbox"/> PRODUCTION START OR RESUME <input type="checkbox"/> REPERFORATE CURRENT FORMATION <input checked="" type="checkbox"/> TUBING REPAIR <input type="checkbox"/> WATER SHUTOFF <input type="checkbox"/> WILDCAT WELL DETERMINATION	<input type="checkbox"/> ALTER CASING <input type="checkbox"/> CHANGE TUBING <input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> PLUG AND ABANDON <input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> SIDETRACK TO REPAIR WELL <input type="checkbox"/> VENT OR FLARE <input type="checkbox"/> SI TA STATUS EXTENSION <input type="checkbox"/> OTHER	<input type="checkbox"/> CASING REPAIR <input type="checkbox"/> CHANGE WELL NAME <input type="checkbox"/> CONVERT WELL TYPE <input type="checkbox"/> NEW CONSTRUCTION <input type="checkbox"/> PLUG BACK <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> APD EXTENSION OTHER: <input style="width: 100px;" type="text"/>
<input type="checkbox"/> ACIDIZE <input type="checkbox"/> CHANGE TO PREVIOUS PLANS <input type="checkbox"/> CHANGE WELL STATUS <input type="checkbox"/> DEEPEN <input type="checkbox"/> OPERATOR CHANGE <input type="checkbox"/> PRODUCTION START OR RESUME <input type="checkbox"/> REPERFORATE CURRENT FORMATION <input checked="" type="checkbox"/> TUBING REPAIR <input type="checkbox"/> WATER SHUTOFF <input type="checkbox"/> WILDCAT WELL DETERMINATION	<input type="checkbox"/> ALTER CASING <input type="checkbox"/> CHANGE TUBING <input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS <input type="checkbox"/> FRACTURE TREAT <input type="checkbox"/> PLUG AND ABANDON <input type="checkbox"/> RECLAMATION OF WELL SITE <input type="checkbox"/> SIDETRACK TO REPAIR WELL <input type="checkbox"/> VENT OR FLARE <input type="checkbox"/> SI TA STATUS EXTENSION <input type="checkbox"/> OTHER	<input type="checkbox"/> CASING REPAIR <input type="checkbox"/> CHANGE WELL NAME <input type="checkbox"/> CONVERT WELL TYPE <input type="checkbox"/> NEW CONSTRUCTION <input type="checkbox"/> PLUG BACK <input type="checkbox"/> RECOMPLETE DIFFERENT FORMATION <input type="checkbox"/> TEMPORARY ABANDON <input type="checkbox"/> WATER DISPOSAL <input type="checkbox"/> APD EXTENSION OTHER: <input style="width: 100px;" type="text"/>			
12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc. Resolute proposes to make UIC repairs to the subject well to enhance production in the area. Attached is the proposed procedure and well bore diagram. Work is to commence on 9-24-13.					
Accepted by the Utah Division of Oil, Gas and Mining Date: October 08, 2013 By: <u>Derek Quist</u>					
NAME (PLEASE PRINT) Sherry Glass	PHONE NUMBER 303 573-4886	TITLE Sr Regulatory Technician			
SIGNATURE N/A	DATE 9/9/2013				

RESOLUTE

NATURAL RESOURCES

Ratherford Unit 18w-12
1980 FNL, 560 FWL
SWNW sec. 18-T41S-R24E
43-037-31153

UIC Workover

Job Scope

Job Scope: Pull tubing & packer, run new tubing (pending inspection) & packer.

Procedure

****Shut in offset injection wells 18w-23 & 13w-42.**

1. MIRU WSU, LOTO. **NOTE: 1.78 plug remains in the well at 5133' KB.**
2. PT the tubing & 1.78 plug. Bleed off any TP, CP. Order KWF.
3. ND WH, NU BOPE. PT BOP against landing donut.
4. J-off packer, circulate KWF.
5. POOH, standing back 2-7/8" Duoline tbg while inspecting each joint; tubing was run 6-21-2013 by Great White snub unit.
6. PU workstring, TIH to recover the 7" Arrowset I-X packer set at 5126' KB.
7. Jay onto the on/off tool w/workstring. RU WL & pull the 1.78 plug.
8. Rekill well as required, POOH with 1-X packer.
9. RIH w/replacement 7" Arrowset 1-X packer with 1.81 plug in place. Set packer at 5100' KB (element).
10. Jay off packer & circ packer fluid up backside.
11. Perform mock MIT to 1000 psi.
12. POOH & LD workstring.
13. Pending inspection results, run new 2-7/8" Duoline tubing and **dual seal on/off tool.**
14. Jay onto packer, space out & land tubing. Perform mock MIT after landing tbg.
15. ND BOP, NU WH.
16. MIRU slickline unit. Test lubricator to 2500#
17. RIH gauge ring, shear plug, and retrieve plug. RDMO slickline unit.
18. RD WSU. Order frac tank for flowback.
19. Schedule MIT w/NNEPA.
20. Notify the Area Production Supervisor that well is ready to backflow & return to injection.
21. RDMOL.
22. **IMPORTANT: Backflow both the well and the lateral line before returning to injection.**

RATHERFORD UNIT # 18-W-12
GREATER ANETH FIELD
Surface Loc: 1980' FNL & 560' FWL
SEC 18-T41S-R24E
SAN JUAN COUNTY, UTAH
API 43-037-31153
PRISM 0043061

B.H. Location Lateral #1:
2463.40' S & 2632.04' E of Surface Location

B.H. Location Lateral #2:
1771.45' N & 2422.47' W of Surface Location

Injector

